

THE FAR EASTERN REVIEW



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遠東時報

GEORGE BRONSON REA PASSES

AMERICA'S STAKE IN THE FAR
EAST

Vol. XXXII

NOVEMBER, 1936

No. 11

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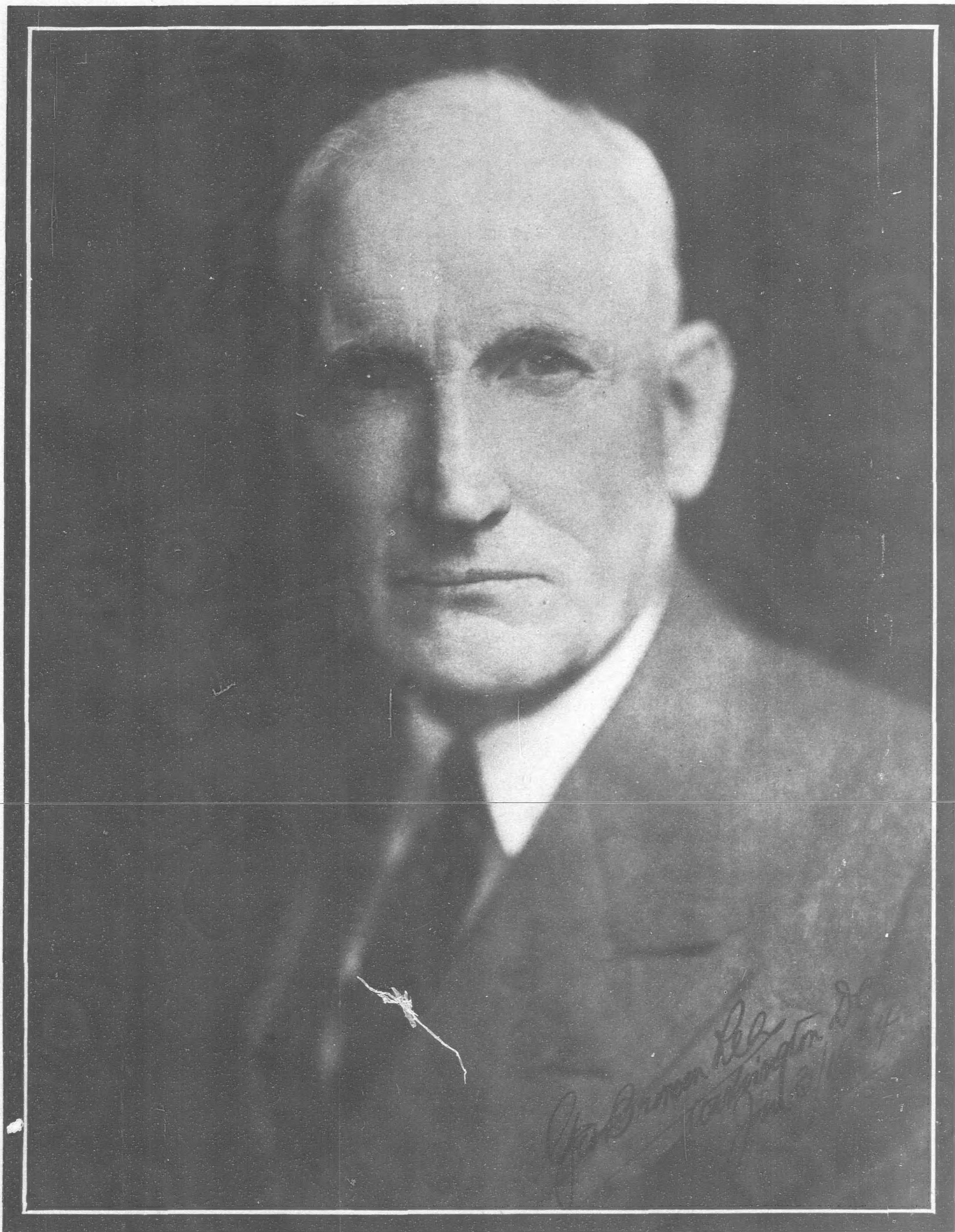
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"The Old Master"
GEORGE BRONSON REA

The Far Eastern Review

ENGINEERING

FINANCE

COMMERCE

VOL. XXXII

SHANGHAI, NOVEMBER, 1936

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George Bronson Rea Passes

By C. J. LAVAL

It is a sorrowful task to write of a friend who has died. The event itself is so grimly conclusive, so overwhelming for those on whom the blow falls that they may only stand in silent grief with their memories, and words are of no avail. The thoughts and the feelings of a veritable host of people in many far places of the world, and particularly in the great centers of the Far East, were stirred deeply when telegraphic news services on Sunday, November 22, brought to them the word that George Bronson Rea had come to the end of his long career. His was a singular personality; his passing leaves empty in contemporary journalism and in phases of international life a place that must long remain untenanted; his memory will live as long as Far Eastern history continues to unfold. He put on his times an indelible mark and now, at the ending of his labors, his foes, and he rejoiced in facing many who opposed him, accord to the man the salute that is the due of a valiant adversary; his friends sense a loss that cannot be recovered, and all of these sorrow with the widow and the children that are left behind.

The end came for Bronson Rea in Johns Hopkins Hospital at Baltimore, Maryland, after several months of illness that first attacked him last April when he was in Japan. He was 67 years old. Evidence is not wanting that, characteristically, he went down fighting, for communications received in the Far East in recent weeks—bringing hopes to friends who were aware of his illness—disclosed that he was up and about in Baltimore and Washington early in October, and a cablegram that he sent to Shanghai at this time revealed that he was still alert and active in journalistic work, and “right on top” of the news of the day. Mrs. Francesca Rea, the widow, and her daughter, Gloria, who is fourteen, passed through Shanghai last summer on their way from Japan to the United States. They brought word at that time that Mr. Rea’s doctors felt wholly confident that his affliction, a growth in the larynx, would yield to treatment. Probably it was Bronson Rea himself who sent them this assurance. He was not the man to surrender to any odds—ever the fighting optimist.

Stirring Events in Many Lands

The life story of Bronson Rea, which leads through so many stirring events and into many distant lands, had its beginning in Brooklyn, New York. He was born there on August 28, 1869. His people were sturdy American stock of Scotch-Irish lineage. His father was Joseph B. Rea and his mother was a member of the Bronson family, which has a place in New England annals. Bronson Rea’s youthful interests centered upon mechanical engineering and thus he is found in his twenties in Cuba as the representative of American manufacturing interests installing equipment in sugar mills. It was inevitable that he should do two things in logical sequence—thrust himself into political affairs and begin to write about them. The Cubans were then in revolt against Spanish rule in the conflict that led to the Spanish-American war, and in the natural course of things Bronson Rea quit building sugar mill machines to become the correspondent of the *New York Herald* at the scene of conflict of the Cuban war for independence through the years 1895-97.

On the day of the event that caused the American declaration of war against Spain, a period of the greatest tension in the Cuban

Capital, Bronson Rea was aboard an American warship commanded by Captain Sigsbee in Havana harbor. That was before the days of wireless, and military and naval practice then were less conventional than they have become. This may explain how it fell to the lot of Bronson Rea to carry ashore to the telegraph office Captain Sigsbee’s message to Washington reporting the destruction and sinking of the *Maine*. This pencilled scrawl with the American naval officer’s signature was treasured through the years of his later life by Bronson Rea, and he asked that it be sent him when he went to live in Washington in 1933. He intended, he said, to present it to the Navy Department at Washington.

With the close of the Spanish-American war, Bronson Rea turned his steps early in the century toward the Philippines where world interest was then centered on the delicate and difficult business of shifting to the American Government the possession of the Islands. Bronson Rea then had become correspondent of *Pulitzer’s New York World*, which has lately been absorbed into the Scripps-Howard newspaper holdings and merged into the *New York World-Telegram*. At that time in his early thirties, he was definitely launched before the American public as a writer and his engineering career lay behind him, abandoned for the time, but not wholly forgotten. He had just written his first book then, “Facts and Fakes About Cuba,” a volume, now all but forgotten, that attracted some little notice.

Of all the reviews that were published about this book Bronson Rea retained but one through later years, and he delighted to exhibit this whenever occasion offered. It was a short review that had appeared in a Chicago newspaper. The reviewer dealing with the volume in substance said, “We have received and read the book, ‘Facts and Fakes About Cuba,’ by George Bronson Rea, and we note that the author describes a personal experience when as the captive of a Spanish general he was sentenced to be shot before a firing squad. After reading the book, this reviewer is forced to the conclusion that no good reason exists why this sentence was not duly carried out.”

Married in Brooklyn

It was about the time that he began work as a newspaper war correspondent that Bronson Rea married a Brooklyn girl, Miss Harriet S. Carter. This marriage took place on January 12, 1897. The three children of this marriage all survive, and are residing in the United States, but the first Mrs. Rea passed away some years ago. William Carter Rea, the eldest son of this marriage is well remembered in the Far East as a publisher of an automotive journal. With his wife and family he is now in California. The second son, Henry Carter Rea, also married, is a geologist connected with the Standard-Vacuum Oil Company and at present resides in California. The daughter, who was Miss Consuelo Rea, was married in Shanghai four years ago to Mr. M. R. Doggett, who then was well known in Far Eastern commercial and club life and was connected with the Universal Leaf Tobacco Company. Mr. and Mrs. Doggett are residing in North Carolina.

After he had established his residence in Manila, early in the century, Bronson Rea swiftly made a place for himself in the political life of the Island Capital. The question of tariff legislation concerning the commerce of the United States and the Philippines then was a major issue, both at Washington and in Manila. Bronson

Rea was appointed Delegate for the Philippine Government and in this capacity went to Washington to appear for commercial interests in the Philippines. A year before this, in 1904, he had founded his magazine, *The Far Eastern Review*, which in 1906 was removed to China and since then has been published in Shanghai. With the transfer of his magazine to a new field in China, Bronson Rea's personal interests were diverted and, when he became a resident of Shanghai, there was an awakening within him of the engineering instinct that had been dormant through his years as a war correspondent. His later career in China furnishes evidence that he was able to visualize the needs of the country from the standpoint of an engineer.

Those were the fading days of the Manchu regime when liberal revolting forces were carrying forward the work that in 1911 brought about the collapse of the Ching Dynasty and the end of Monarchy in China. Bronson Rea espoused the cause of the revolutionists and it was through those years that he built the staunch friendship with Dr. Sun Yat-sen, the Father of the Chinese Republic, in whose service he was actively engaged after the founding of the Republic. This was a friendship of East and West—"when two strong men stand face to face"—and it lasted until the day Dr. Sun Yat-sen died. On the part of Bronson Rea the friendship flamed most fervently when the fortunes of Dr. Sun Yat-sen, in his native land, were at lowest ebb—when many of those who were later to profess veneration for and sanctified the name of the great Chinese patriot were loudest in his denunciation.

Becomes Advisor to Dr. Sun Yat-sen

It was one of Dr. Sun Yat-sen's first acts after the founding of the Chinese Republic to appoint Bronson Rea, Advisor, and later he gave whole-hearted approval to a draft plan that Bronson Rea presented for a system of railways in China. Rea, the engineer, saw clearly that the single great necessity for the welfare of China was a system of adequate railway communications. The dreams of the engineer and of the Chinese rulers of that day have not yet adequately been brought to realization, and the necessities of the Chinese nation, the things they aimed at in the early days of the Republic, have only increased, becoming more and more manifest with the passage of years. It is said that Bronson Rea was the only foreign individual who ever received from Dr. Sun Yat-sen an unrestricted Power of Attorney. In 1913-14, as Advisor to the Chinese Minister of Railways, the task of finding financial support to begin the vast project of building Chinese railways was placed in Bronson Rea's hands. He went to New York, and later to London, where he achieved some measure of success. Views that the American State Department took with regard to aspects of the financing that was being arranged in New York through Rea's efforts brought to him heart-breaking disappointment, and his undertaking was further complicated and made more difficult by the clash of conflicting national interests that were thrusting into China at that time, each intent on its own aims, and hostile to all others. Came the World War and great undertakings in China, as in all the rest of the world, were brought to a pause.

When the United States entered the war, Bronson Rea at the age of 49 offered his services to his Government, proceeding to Washington at his own expense to do this. His efforts to thrust his way, as an American fighting man, into the forefront of the conflict in France were the normal reaction of an aggressive mentality. His qualifications as an engineer won for him some consideration, but the authorities at Washington were unwilling at that time to have him in active military service. They gave him rank as Captain and appointed him to the post of Assistant Military Attaché at Madrid, Spain. It was in the period of his service in Spain that his second marriage took place, on January 8, 1919, when he was married to Miss Francesca Ruiz-Moron. She and their young daughter Gloria were with him at the end.

Bronson Rea through this period had left all his plans and projects in China behind him, but he kept these things in mind and it follows logically when the war was ended to find him in 1919 in Paris acting as Technical Advisor to the Chinese Delegation to the Peace Conference at Paris.

The events in Bronson Rea's life following this time and beginning in 1920 have been made the subject of the most unsparing attacks against him, and inspired enmities that at times embittered him in later years, but he held to ancient loyalties and many of his old friendships remained unimpaired. Those who opposed

and sought, often by unfair means, to crush him, discovered in Bronson Rea an antagonist not lightly to be reckoned with. Through the years of his absence from Shanghai *The Far Eastern Review* had been published without interruption under direction of associate Editors employed by Bronson Rea while his own energies were being devoted to the interests either of the Chinese Government or, in wartime, of his own Government. Let it be noted in passing that for his war service he never sought from the American Government any pension or bonus or other special recognition, such as became so fashionable in the States, and scornfully he rejected any such idea. "I wasn't in the War," he explained once. "They wouldn't let me in."

China in the 'Twenties . . .

The Far Eastern Review consistently had sponsored and supported causes and undertakings of the new Chinese Government through all the early years and several of those employed by Bronson Rea with editorial control of his magazine won important places of prestige and reward from the Chinese. Bronson Rea's own writings took the direction of his efforts for the nation and he sought by all means to promote the development and the betterment of the Chinese Republic, particularly in the building of railways and in industrial development. Bronson Rea's viewpoint essentially and in accord with the man's natural bent was constructive, but in the early 'twenties, in the days of the tuchuns and the sectional overlords, the country was hopelessly split by warring factions, the North and the South, each with separate regimes, and within these geographical divisions were lesser sub-divisions and factions in armed conflict. In the early 'twenties it required no engineer's eye to see that chances for growth and development in China were hopeless. In that era Bronson Rea was fiercely in sympathy with those Chinese who sought vainly to bring order out of chaos, but he was realist enough to know that many years would pass before this might be achieved. Opposed to hopes for progress in China then were not only the warfare of opposing factions within the country, but a further complication was the clash of jealously contending alien nationalities struggling for special advantages.

In contrast with all this, Bronson Rea, the engineer, with all the rest of the world had been observing the emergence of Japan as a world power, and, with the rest of the world, he was impressed with the march of events there when Japan speedily had set its house in order after the Meiji Restoration, had won free from trammels of extra-territoriality in the 'nineties, then had conquered the forces of the Russian Czar and had gone on to ever greater things. Here were no internal warring factions, no struggles for advantage by aliens from without, only orderly progress, betterment and swift, systematic upbuilding, such as the founders of the Chinese Republic and Bronson Rea, the engineer, with them had dreamed of for China.

In Paris in 1919, Bronson Rea's newspaper sense had led him to a knowledge of another important thing that was not disclosed in an official manner until 1922 at the Washington Conference. This was the existence of the secret treaty between Russia and China through the period of the Russo-Japanese war and before. Bronson Rea learned then that when Japan emerged victor from this conflict fourteen years earlier, in 1905, not only had China escaped without penalty, but the Japanese Government, in fact, had tendered an official apology, because the war through necessity had been fought in Manchuria, then Chinese territory: This knowledge did violence to the man's sense of fair play and stirred his sympathies for Japan, the loser at Portsmouth.

At that time, in the 'twenties, a new species of Chinese official had appeared on the scene, a younger generation tending to display an arrogant impatient disdain of aliens of every degree, loosely termed sometimes the "returned student type." In this category were certain Chinese elements who were frankly scornful of the works of their forebears and elders, youthful zealots who asserted that Dr. Sun Yat-sen was a "visionary" and a dreamer who should be shunted into obscurity. Bronson Rea shared this opprobrium in fullest measure, and from one or another of these elements he suffered personal grave affronts, one of the few things he ever afterwards was reluctant to talk about. And, in passing, let it be noted that it was never the course of wisdom at any time to give flagrant personal offence to Bronson Rea. His was the fervid, if not volcanic, temperament of the Celt, quick to adjust personal differences on the spot with whatever means were handiest. Friends who were with Bronson Rea in Paris in 1919 tell of an occasion when

a fellow countryman inadvertently employed a familiar expletive in addressing Bronson Rea, and neglected to smile. This was highly imprudent, and the immediate result was that the offender was taken to a hospital for repairs while Bronson Rea perforce had to suffer the indignity of a period of questioning in a Parisian police station.

Contacts with the Japanese

All of these things that happened, after Bronson Rea had thrown himself seriously into work in China, tended to deflect his sympathies and his interest in the direction of Dai Nippon. Characteristically he did the thing he had always done wherever his work had carried him, what any good reporter always must do to succeed. In his quest for information he went directly to the top, that is, he presented himself to the Japanese leaders of that day. In doing this Bronson Rea outraged none of the tenets of his earlier faith, and the loyalties built up in association with Chinese leaders were not impaired, for has not Dr. Sun Yat-sen, the greatest patriot of them all revealed in the records he has left behind that he saw virtue in close co-operation between Japan and China?

In short, all these circumstances furnish basis for the surmise that, had Dr. Sun Yat-sen retained his vigor, the course of history in China would have taken a different direction, and in this, assuredly, Bronson Rea would have played an important rôle, for, essentially, he was ever the builder, in every thought and act. In the dark period for the great Chinese patriot that followed immediately after the revolt at Canton of Chen-Chiung-ming, Minister of War, in 1922, when Dr. Sun Yat-sen narrowly escaped with his life, the malady that was to claim him, the same scourge that overtook Bronson Rea, had put its grip on him, clouding a vision that China has not yet replaced. Like the warrior he was he continued to fight with all his fading strength. Disappointment and sickness instead of an accustomed health and vigor, treacheries where loyalties should have stood, conflict and disorganization where he had striven to build unity and strength—these were the portion of the Great Chinese Patriot in his last sorrowful years before that day in Peking, on March 12, 1925, when at length his hands were folded and his work was done.

Bronson Rea saw and lived intimately with these unfolding events—the visual personification of that familiar traditional American thought that has survived so many years, American friendship for China—and his engineer's mind exactly appraised all the values of this drift of things. He saw sharply foreshadowed the final blow in the passing of Dr. Sun Yat-sen long before it fell, and the heart had gone out of him for the work, the vast task of building the modern China. Afterwards, in 1929, the flame within him rose again briefly for a period when he gave his services to the Chinese Ministry of Railways, but the inspiration then was gone. He, better than any other, even among the Chinese, knew this. The dreams of the dawn time of the Chinese Republic, when he had walked so confidently with Dr. Sun Yat-sen, never died. "Build railways for China! More railways." This was the cry in his heart even when he was dying. Was this a feeling inspired by self interest?

The full record of events of those times in Bronson Rea's life does not seem adequately to bear out the accusation that he "sold himself," or that his motives ever were actuated by self interest. Those who were most intimate with the man, and hosts of every degree in the social scale, from the poor and the needy in the depths into the councils of world chancelleries, were all aware that self interest was never a primary consideration with Bronson Rea in the things, big, constructive things, he attempted to do. One understands why one of Bronson Rea's old retainers, a humble aged Chinese, silently shed bitter tears when he was told that "the old Master was dead."

And no subsidy has ever been paid to Bronson Rea's magazine, *The Far Eastern Review*. In the years of association with Bronson Rea this writer has been charged with the most intimate and confidential matters having to do with Bronson Rea's interests and his affairs. He has worked with and played with the man, and Bronson Rea knew how to play—hard—but he ever played to the code of the true sportsman, and visual evidence even of this is not wanting, but is to be seen under glass in a frame which contains five signed playing cards in the Shanghai Club. In explicit terms Bronson Rea declared to the writer on several occasions that he had declined to accept any subsidy from Japanese interests. Through recent years and as these lines are written, the writer has been in sole and

complete control of all of Bronson Rea's affairs in China together with the records of his earlier activities, and in these records, or within the knowledge of the writer, is no evidence of the payment of subsidy to *The Far Eastern Review*. In fact, the writer only wishes devoutly that he had some such prop on which to lean in this sad and difficult time, for *The Far Eastern Review*, with the outstanding record of thirty-two years of successful existence, must and shall go on. Bronson Rea would have it so.

The Deciding Factor in the Case

Some of the influences that swayed and modified Bronson Rea's viewpoint have been traced herein to explain the line of policy that he took in the closing years of his life. In addition to these influences was another factor that was more potent than any other consideration in determining the course he set. From the best of this writer's intimate knowledge of the working of Bronson Rea's mind he would record in simple terms here that Bronson Rea acted simply as a true American patriot, writing, speaking and working, as his record through the past fifteen years discloses, primarily for what he deemed to be the best interests of his own country.

After his return to China from Europe Bronson Rea encountered a movement which originated in Peking that had the direct purpose of bringing about a war between the United States and Japan, with the double purpose of crushing Japan and aiding China. At that time when all Europe, and much of the rest of the world, was staggering under the burdens left by the war, the thought that was uppermost in the commercial world and in the minds of statesmen everywhere was that, of all the world, Japan and the United States were the only powers that had emerged from the great conflict in Europe with huge profits. It is a rational surmise, therefore, that the continental powers, in the plight in which they found themselves, would all look with some measure of approval upon the idea of another war at that time between Japan and the United States. It was apparent that if such a conflict arose the vast tide of wealth that had flown into the United States and Japan in the years of the Great War and afterward would reverse its direction and flow back to the sources in Europe whence it had come, while at the same time the lucrative and expanding trade of the United States and Japan in the Far East would remain to be divided among the neutral powers of Europe. This is the situation that furnishes the reason for the policy Bronson Rea determined to follow. The circumstance that this purely American viewpoint should be in conformity with Japanese national policy—for Japan had no wish for a war with the United States—cannot be viewed as anything more than a coincidence.

In a great portion of his writings through the past fifteen years, over and again, Bronson Rea stressed and emphasized the contention that in a war with Japan the United States could not possibly win anything, for she has refused concessions in China, is surrendering possession of the Philippines and not even the maddest legislator has even ever dreamt of American territorial expansion in the Far East where her principal trade advantages lie in Japan. Increased trade with China on terms that have existed thus far, the former Publisher of *The Far Eastern Review* also pointed out, could not be regarded as desirable from an economic viewpoint, because the United States, for every dollar of profit derived from trade with China has been paying back to that country seven dollars. A familiar bit, of phrasing Bronson Rea used in this connection comes to mind: "The United States, he wrote, has no intention of fighting a destructive costly war just to remain in business as an eleemosynary institution." In the direction of his publishing business, Bronson Rea rarely gave orders, usually suggestions, but he reiterated over and over again, as an underlying basic concept of editorial expression, that anything and everything tending to promote ill-feeling or conflict between the United States and Japan was harmful to the interests of the United States.

Back in Washington

Through nearly three years, 1927-29, Bronson Rea was in Washington in the capacity of Representative of the American Chamber of Commerce of Shanghai. He continued his magazine work through this period and in his writings in the later 'twenties he clearly predicted the outbreak in Manchuria in 1931. After the formation of the new Government of Manchoukuo, in 1932, Bronson Rea was

OUR SLOGAN AND CREED
FOR THE
SALVATION AND UNIFICATION
OF
CHINA
BUILD RAILWAYS!
MORE RAILWAYS!
KEEP ON BUILDING
RAILWAYS!
CONSTRUCT
HIGHWAYS
FOR MOTOR-VEHICLES TO FEED THESE
RAILWAYS
AS FOR
AEROPLANES,
WE SUPPORT THEIR EMPLOYMENT FOR LEGITIMATE COMMERCIAL PURPOSES. WE ARE OPPOSED TO THEIR USE AS BOMBERS FOR THE ENFORCED UNIFICATION OF 500,000,000 PEOPLE UNDER THE RULE OF ANY ONE OVERLORD. WE WOULD SEE CHINA UNITED BY MORE PEACEFUL MEANS, FOLLOWING THE IDEALS OF ITS GREAT LEADER, SUN WEN, WITH WHOM WE WORKED TO BRING THIS ABOUT IN THE ONLY PRACTICAL AND HUMANITARIAN WAY POSSIBLE; BY
BUILDING
RAILWAYS!

George Bronson Rea's Last Message to China

Through his whole career in China the development of the country was close to his heart to the end, and the necessity for the building of railways in China amounted to an obsession. He sought by every means to emphasize this necessity of the Nation and this thought was so urgent in his mind that recently it could only find outlet in this explosion of Gothic type capitals, a poster page make-up, which he drafted a few months ago and sent to Shanghai with the instruction that it should be printed in the magazine whenever the occasion offered.

asked to take the post of Counsellor to the Ministry of Foreign Affairs of the new Government. A similar appointment under the Manchoukuo Government was given to a prominent Briton, Mr. Arthur H. F. Edwardes, former Commissioner of Chinese Customs, who since that time, as representative of Manchoukuo, has resided in London. Those who denounced Bronson Rea for accepting this appointment, saying he was unfaithful to his American citizenship and uttering other accusations, to which he was too proud to reply at the time, were uninformed about actualities and had no knowledge of the man or his methods. When this appointment was tendered to Bronson Rea, before he definitely accepted it, he presented to the American Consular authorities in China a full report of the matter, requesting that this should be referred to the State Department at Washington. Later he went to Washington himself to report there in person to President Hoover and to the State Department before beginning actual work as Counsellor to Manchoukuo. Assuredly had disapproval of his purpose been voiced in American official quarters at Washington, Bronson Rea never would have proceeded to Geneva, for first of all he was an American. An excerpt from a letter he wrote to his Editor in Shanghai at this time, November 21, 1932, may give an interesting sidelight:

"I saw President Hoover when I passed through Washington," runs the letter, "and he assured me that there would be no war between the U.S. and Japan, which took a great weight off my mind and enabled me to proceed with my mission with greater assurance. You were quite right in using the title 'The Dangerous Mr. Stimson,' for had he been permitted full scope with his policy, war could not have been avoided. Stimson believed war inevitable, and his military aide was passing the word around confidentially to the Washington newspapermen that war could not be avoided. Alarmed at the dangerous drift of this policy, Admiral Pratt and Secretary Adams called on Hoover, and Pratt did the talking. He told Hoover 'that war with Japan was absurd. The American Navy was not prepared. Japan could take the Philippines overnight, and it would take two years for us to retake them. Certainly, if the boycott was declared, it would have to be enforced by a blockade, and this meant war.' The Secretary of War and the General Staff coincided on these views and Hoover called Stimson off. I spent an afternoon in the Navy Department, and they told me there that the above story was one hundred per cent true, but it did not tell half of what Pratt said to Hoover. The Navy and the Army are sore as hell over Stimson's policies, as the former especially realizes that to fight a war in the Pacific, we would have to have a fleet three times as big as Japan's and it would take two years' working at full blast before we could hope to fight. Certainly, the Navy does not intend to be the Goat for Stimson, for in the event of war the whole country would depend upon the Navy to make a quick showing and victory, and if they did not, the Nation would turn on them. So you can begin to understand how close we were to being drawn into war by the State Department, the result of our fool diplomacy in believing that everything that China does is right, and that Japan is always wrong."

The Meeting at Geneva

Bronson Rea went on to Geneva to attend the session of the League as Representative of the Government of Manchoukuo, prepared to answer questions or supply information, fortified by

thousands of cablegrams that were sent to him, from centers in Manchoukuo particularly. The refusal of the League tribunal to hear Manchoukuo's side of the case, the withdrawal of the Japanese delegates that led to Japan's withdrawal from the League after having recognized Manchoukuo, and the march of events since are history. After a short trip back to the Far East in 1933 and a tour through Manchuria, Bronson Rea went to Washington to reside and at this time, while he was living at the American Capital, he wrote the book, which has taken rank as the outstanding work* on Manchoukuo under the title, "The Case for Manchoukuo." In a letter, written in November last year to a friend, Bronson Rea says about this work . . .

"The book was written to reach the small-town newspapers of the United States, which to-day make public opinion in the country. I knew I could make no impression on the larger New York, Washington and Chicago newspapers as their editorial policy was fixed and could not be shaken, so I resolved to go over their heads to the smaller papers. I might have written the book in a different style, and carefully weighed each word and balanced every statement, but in that case no one would have read it. I tried to reach the ordinary American, the man-in-the-street, and the average editor who was not committed. I might have made a big noise over the book, and advertised it more, but I thought it best to soft-pedal it, even in the Review. I have over two hundred and fifty reviews to date, and I mean reviews, not just mention. Many of them are full page, others two and one column articles signed by Reviewers, with others half and quarter column. With only four or five exceptions, three Communist papers, and one missionary (Dr. Yard) all the reviews are favorable and tell me that it went over. It made them think. That was all I could ask for. Frankly, I was amazed myself over the reviews, for in my long experience as an editor, I know of no other book on the Far East so extensively and so favorably reviewed. This, of course, was because for the first time, the other side of the case was brought out and supported by facts and figures, which could not be waved aside as of no consequence or as propaganda."

Bronson Rea returned to the Far East last year, remaining a short time in Tokyo and then proceeding to Manchoukuo, where he spent a period of weeks. Late in the summer he returned to Tokyo and, as Mrs. Rea and their daughter, Gloria, had then arrived in Tokyo, he determined to establish a residence there for them, intending himself to pay a visit to Shanghai at the first opportunity. The illness that was at length to claim him was then upon him, but it was not until last April that he consented to bring his labors to a pause to enter hospital. They told him at St. Luke's Hospital in Tokyo how serious was the malady which had attacked his throat, and on the advice of physicians in Tokyo he sailed in June for the United States to enter Johns Hopkins Hospital for "radium treatment" under the hands of specialists at the Baltimore institution. One of the last cables he ever sent to Shanghai carried the admonition "Don't worry." To this we may say, "Perhaps"; assuredly we must grieve, for something in life that was precious is gone, a buoyant optimistic familiar spirit has been taken from us. Valiant soul—good reporter—steadfast friend—May God give him rest.

* "The case for Manchoukuo" is under official ban in China where its sale is forbidden.

PEIPING-HANKOW RAILROAD

A seven-year-plan calling for the increase of railroad property, development of traffic and payment of debts has been formulated by the Peiping-Hankow Railway Administration with the ultimate object of making the longest government line in China the "model railroad" of the country.

The project, it is understood, has already been approved by the Executive Yuan and will be enforced immediately. The cost is estimated at \$2,200,000.

According to the scheme, 500,000 sleepers and 5,500 tons of rails will be replaced within seven years. Aside from bridges at Hsinlo and Fengchuen, which will be rebuilt presently, all other

bridges on the line will be repaired by five stages: from Hankow to Hsinyang in the first stage, from Hsinyang to Yencheng in the second stage, from Yencheng to the south bank of the Yellow River in the third stage, from the north bank of the Yellow River to Shihchiachwang in the fourth stage, and from Shihchiachwang to Peiping in the fifth stage.

A new iron bridge will be built across the Yellow River to replace the present one which is in a precarious condition. The design for the new bridge has already been worked out by bridge experts and the construction cost is estimated at \$7,500,000.

America's Stake in The Far East*

By MIRIAM S. FARLEY

AMERICANS have an international reputation for being businesslike, efficient and hardboiled. Budgets, cost accounting, market surveys, statistics, statistics and yet more statistics, attest our devotion to the hardheaded gospel of facts. The man from Missouri is a national symbol. We don't guess; we know.

But when it comes to political matters, the average American abandons the hard common sense for which he is justly famous, and plunges headlong into a romantic world of illusion, emotion and fantasy. The business man who would not think of opening a branch factory without elaborate surveys of demand, costs, amortization and what not, will blithely cast a vote on the basis of nothing more substantial than hearsay and plain prejudice. When several million citizens do this, the consequences are likely to be both unexpected and unpleasant.

No better illustration of American innocence is to be found than the subject of this essay. The existence of an American stake in the Orient is commonly assumed. Vague references to it are frequent in the halls of Congress, in the press, and in political orations. It serves as one of the principal justifications for the United States navy and for our whole policy in the Orient. But what exactly it consists of, how large it is, how essential it is to American life—these are prosaic calculations which are all too often absent from the arguments of militant jingo and ardent pacifist alike. Why does the sovereign citizen send his marines to Shanghai, his gunboats to the Yangtze-kiang? He doesn't know; he guesses.

In view of the pressing nature of our domestic problems, it may seem like an exaggeration to say that no issue confronting the American people at the present time is more momentous than that of Far Eastern policy. But it is not an exaggeration. For we now stand at a cross-roads; we are, at the moment, relatively free to choose our course; and the choice may well be one between war and peace.

Even the casual newspaper reader knows that the international situation has never been more threatening. Observers of all shades of opinion are agreed that the outbreak of a major war is highly probable, and United States involvement scarcely less so. It is equally clear that for this country, the particular danger spot lies in the Far East. If it is possible to forestall such a catastrophe by deliberate action, obviously it can only be done now, not the day after some future Sarajevo when we have become so entangled in the consequences of our past actions that little choice is left.

It may be, indeed, that stern realism and regard for the best interests of the United States demand that we run this risk; it may be that we should not—whether acting alone or in concert with others—shrink even from the final arbitrament of force. In any case the choice is of some importance; and it should be unnecessary to labor the point that the only choice which will have any meaning is the choice we make now.

For at least fifty years Far Eastern affairs have occupied a

major place in American foreign relations. The traditional policy of the Open Door in China ranks with "no foreign entanglements" and the Monroe Doctrine as one of the cornerstones of American foreign policy. The Yellow Peril is one of the time-honored legends of American politics. Our great and growing navy is increasingly thought of as a Pacific Ocean fleet. It was on the initiative of an American Secretary of State that the Washington Conference of 1922-23 was held, which stabilized the situation in the Pacific for nearly a decade. The basic principles of the Washington treaties—the 5-5-3 naval ratio, a beginning at disarmament, a guarantee of the territorial integrity of China, and an agreement for consultation among the great Pacific powers in the event of threatened disturbances—were in accord with the views of the American government, which pledged itself to uphold them.

Now the balance of power in the Pacific has again been upset by the action of Japan—an action due not to any gratuitous desire to disturb the peace but chiefly to the fact that Japan has lately forged ahead in her economic development more rapidly than the other leading Pacific countries. America must decide whether or not to acquiesce in some sort of readjustment on a new basis. So far, the United States has taken the lead in maintaining, on paper, the validity of the Washington treaties, and it is largely due to American initiative that the world still declines to recognize the legality of the new situation brought about by Japanese aggression in China.

Obviously the United States has been and is a major force in Far Eastern affairs. Why have we taken the trouble? Not, we may be sure, out of either chronic meddlesomeness or disinterested zeal. The American government has occupied itself in the Far East for the avowed purpose of furthering the interests of the American people. Whether it has gone about this in the best way is of course another question. At all events, a definition of American interests in the Far East must precede any formulation of future policy.

America's stake in the Far East, which is so often alluded to and so seldom defined, is of two kinds. One is a specific interest in American lives, property and trade. The other is the general interest of all peoples in maintaining peaceful and harmonious international relationships.

That the latter is the more important goes without saying. The preservation of peace is worth the sacrifice of a few dollars—even, if need be, of a few lives. But in order to preserve peace in the Pacific we must understand all of the elements involved in the present Pacific tangle. Among these America's economic stake in the Far East stands foremost. Its significance is not to be measured by the dollars-and-cents value of American trade and investments in the Orient. Quite aside from our

FOREWORD

The American Council of the Institute of Pacific Relations believes that it can make no greater contribution to the formation of a sound Far Eastern policy than by fostering popular understanding of the momentous events taking place in the Pacific area and of the forces which lie behind them. This article owes its origin and existence to that belief.

In limiting the scope of the article to America's material stake in the Far East—investments and trade—no implication is intended that considerations of pecuniary gain are the only ones bearing upon the formation of policy. The economic bases of our Far Eastern policy have, however, two claims to special attention at this time: they are, as is brought out more fully below, in a certain sense fundamental to all the other motives of policy; and they are very imperfectly understood in the public mind, owing to the lack of convenient sources of information.

Most of the facts in the article, many of the ideas, and some of the phraseology, are taken from an article also entitled "America's Stake in the Far East," by Miriam S. Farley, William W. Lockwood, Jr. and Frederick V. Field, which appeared serially in the *Far Eastern Survey*, fortnightly organ of the American Council, for July 29, August 12 and 26, 1936. This study, to which the reader is referred for more detailed information and statistics, was in turn based upon such official sources as *Foreign Commerce and Navigation of the United States* and *The Balance of International Payments of the United States*; such standard unofficial works as C. F. Remer's *Foreign Investments in China*; and press reports and private information. Use has also been made of a detailed study of *Trade and Trade Rivalry between the United States and Japan*, by William W. Lockwood, Jr., published by the American Council in 1936.

The author of the present essay desires to acknowledge her great indebtedness to the work of her colleagues, while assuming, of course, full responsibility for the presentation of the material in its present form. Nor can the American Council be held accountable for any statements of fact or opinion; its function as publisher is to present the material to the public, not to endorse it.

*For the purpose of this article "the Far East" is defined as including China, Japan, Manchoukuo, the Philippines, the Soviet Far East, French Indo-China, Siam, British Malaya, Netherlands India, and the miscellaneous areas grouped in government statistics under the heading "Other Asia."

interest in preserving and enlarging this economic stake, its mere existence is the tie by which our destiny is inextricably linked with that of nations on the other side of the globe. Through this conductor the tremors of the Far Eastern volcano are transmitted to our shores. Had we no economic connection with the Orient, its political disturbances would neither affect nor concern us.

We make no apology, therefore, for concentrating our attention upon the economic aspects of America's stake in the Far East. It is not contended that economic motives are the only determinants of policy. There are also, as already noted, our interest in the preservation of peace, and, working in the contrary direction, the motives of national honor and national prestige. There is the sympathy felt by Americans for struggling China, dating back to the early days of missionary endeavor. There is a feeling of responsibility for the welfare of our former wards, the Filipinos. There is dislike of militarism and autocracy and concern for the preservation of democracy. There are various degrees of liking and admiration for the different peoples bordering the Pacific. There are considerations of what is known as national defence.

We devote ourselves here to the economic interests because they are more susceptible of objective measurement; because the general public knows less about them than it does about the purely psychological factors, about which, moreover, it has much more extensive sources of information; and finally because, as stated above, we believe that economic interests occupy a position of strategic importance in America's relationship to the Far East.

What exactly do we export to the Far East? What essential imports do we derive from it? What domestic groups, what geographical sections of the United States, have the largest stake in this trade, whether as buyers or as sellers? Does competition from Far Eastern countries threaten United States trade either at home or abroad? How much American money is invested in the Orient? Where, in what lines, and by whom? What Oriental countries are most important to us from the economic standpoint? Is our economic stake in the Orient large or small, when compared with the sum total of American trade and investments, domestic and foreign?

Such questions as these are relatively easy to answer. But they give rise to others which are not so easy. Does this trade, do these investments, pay? Are they an asset or a liability (a) from the standpoint of particular groups, (b) from the standpoint of the nation as a whole? Are they likely in the ordinary course of events to increase or decrease in the future? In the last analysis, is maintenance or expansion of economic intercourse with the Orient essential to our national well-being and progress? In other words, is it worth the cost of its protection?

These are questions which the reader must answer for himself on the basis of his own standards of value and social philosophy. A note of warning should be sounded, however.

First, in bringing the answers to all these questions to bear upon the formulation of policy, it cannot be too strongly emphasized that foreign and domestic policy are only two sides of the same coin. The idea that they can be separated into watertight compartments is one of the commonest and most serious fallacies in political thinking. Foreign policies are not charted in a vacuum. They derive their origin, direction and driving power from the social and political forces at work within the nation. Within fairly narrow limits, the course of American foreign policy is determined by the very structure of American civilization. Hence our decision on the Far East is bound up with other, more fundamental decisions.

The second point follows from this. It is fatally easy to confuse one's subjective judgment of what *should* happen with one's objective estimate of what *probably will* happen. Such confusion is fatal to sound thinking and, therefore, to effective action.

Changing Nature of Our Trade with the Far East

From almost the beginning of its history the United States has bought and sold in the Orient. The nature of this trade, however, has undergone marked transformations, and the present phase of conflict arises out of a long process of historical evolution.

The early China clippers brought back silks, spices and other exotic products, and paid for them mainly in specie. Though restricted in scope, the old China trade was nevertheless important to a small maritime nation which relied heavily upon trade and shipping for its livelihood. After the Civil War, Americans turned their energies inward in a feverish rush to develop the resources of their own continent, and the relative significance of foreign trade correspondingly declined. The ultimate result of this process, however, was to transform the United States into a great industrial nation. By the end of the nineteenth century, when the unsettled frontier had become a thing of the past, America was already entering upon the phase of mass production which was to re-emphasize the importance of an expanding market.

In the meantime, the industrial revolution had brought about a complete transformation in the attitude of Occidental countries toward the Orient. Formerly a source of rare and costly goods upon which was based a lucrative but limited trade, it was now looked on as a vast potential market for the expanding output of Western industry. But exports on any such scale as was now conceived had to be paid for, at least in part, by imports. At the same time the complex pattern of production made possible by the new technology demanded an ever larger and more varied supply of raw materials, some of which, it was found, could be obtained from the Orient. Under these conditions trade between East and West began to expand both in bulk and in complexity. As it

reached out to touch the lives of more and more people on both sides of the Pacific, the ties of economic interdependence between East and West were gradually strengthened.

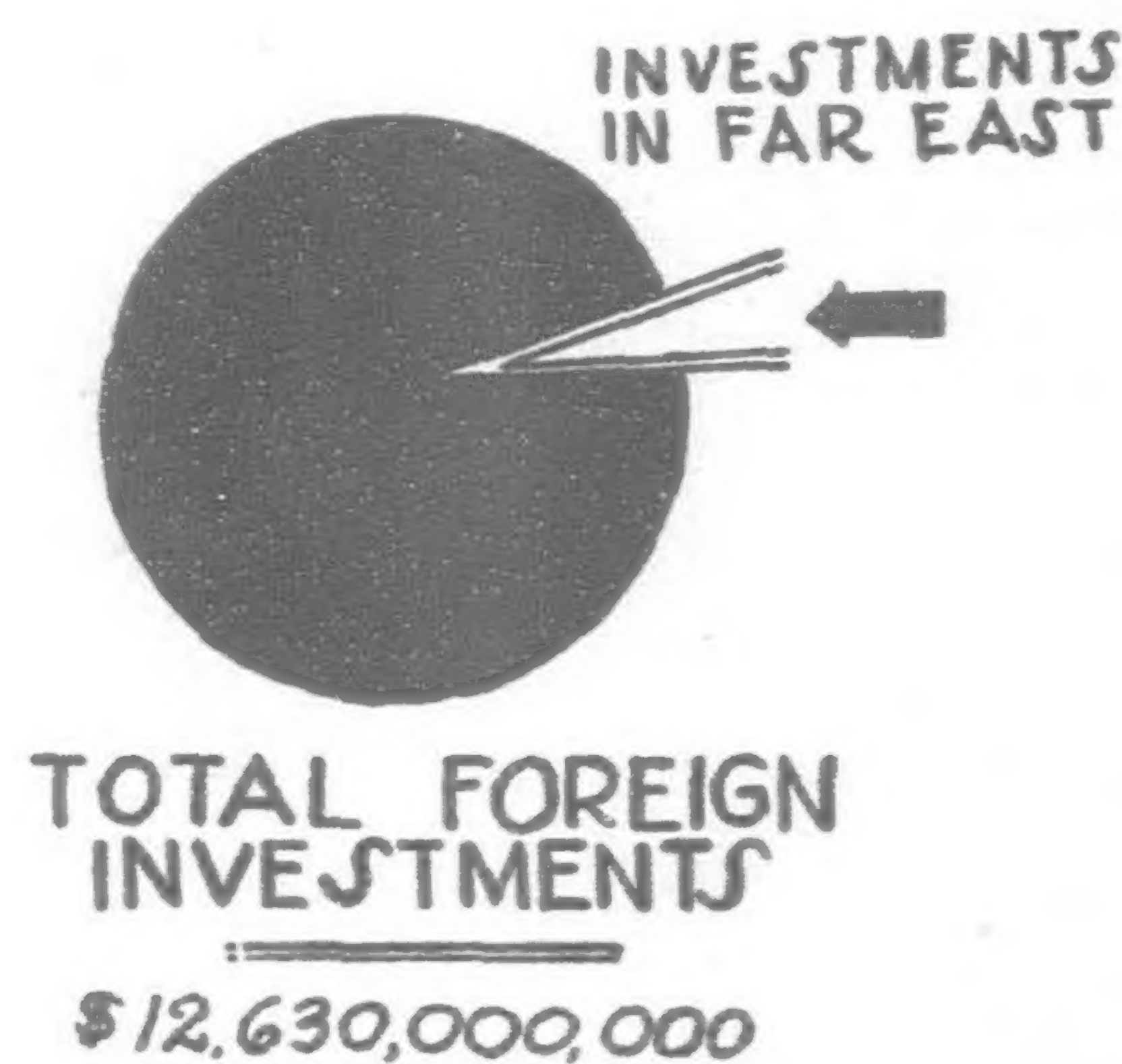
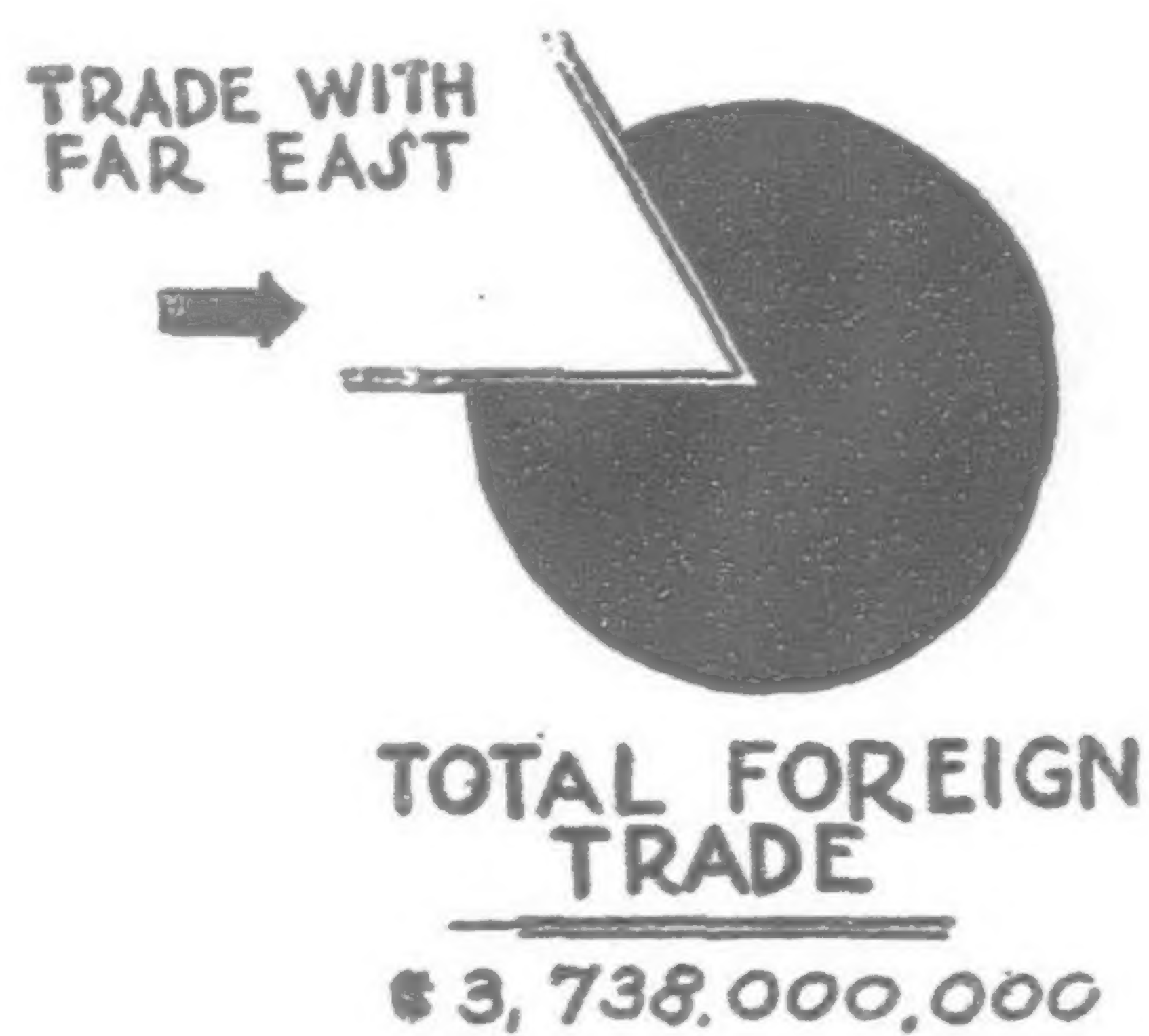
This new drive for trade expansion on a hitherto unprecedented scale carried with it also the necessity for investments. Commercial establishments in the Far East were needed to handle the growing volume of trade.

Banks were required to finance it. Railroads had to be built to transport goods to and from the interior. Mines and plantations were opened by Westerners in the East, for if left to Oriental enterprise they would not have developed fast enough to meet the needs of Western manufacturers and traders, to whom, moreover, they offered the incentive of high if speculative profits. Direct and indirect financing of exports by means of loans also played its part in the stimulation of commerce.

In all of this the United States took part, though less actively than the leading European powers, since, compared with them, it was still in an early stage of its economic development. From this period, however, dates the policy of the Open Door, under which the United States emphatically demanded, and to some extent received, assurances of an equal opportunity to share in the benefits anticipated from the economic development of the Orient.

The post-war period marks a new and significant phase in the evolution of economic relations between East and West. There is no abatement of interest on the part of Western countries in the raw materials and markets of the Orient; on the contrary. But now a new and, from the Western viewpoint, troublesome element has been injected into the situation: the progress of industrialization in the Eastern countries themselves. They are—some rapidly, some slowly—adopting the Western technique, importing or copying Western machines, building their own factories, turning out their own cotton cloth, their own locomotives, their own telephones.

In other words, to an increasing extent the countries of the East are now producing for themselves the manufactured goods for



which they formerly relied upon the West. A fundamental change is taking place in the nature of East-West trade. It is not so much that the East buys less from the West than it used to; but it buys different things. It is demanding fewer of the products of Western factories, and more of the products of Western farms, mines and oil wells to supply its own factories. Of course, this trend is unequal as between different Oriental countries; it is much more marked with a highly developed country like Japan than with a comparatively undeveloped country like China. But the trend is unmistakable.

Such historic changes in the nature of trade are not easily made. While they may in the long run redound to the benefit of one set of Western producers, they cause immediate injury to another set, which sees its established markets shrinking. Moreover, the tension is heightened when the Western industrialist sees the products of Eastern factories—in particular those of Japan—reaching out to compete with Western goods throughout the world. These rivalries are sharpened by the recent tendency toward economic nationalism, which leads both Eastern and Western countries to cut down their imports wherever possible while still seeking with even greater vigor than before to expand their exports. The irritation, discord and friction thus created are among the deepest and thorniest causes of international conflict.

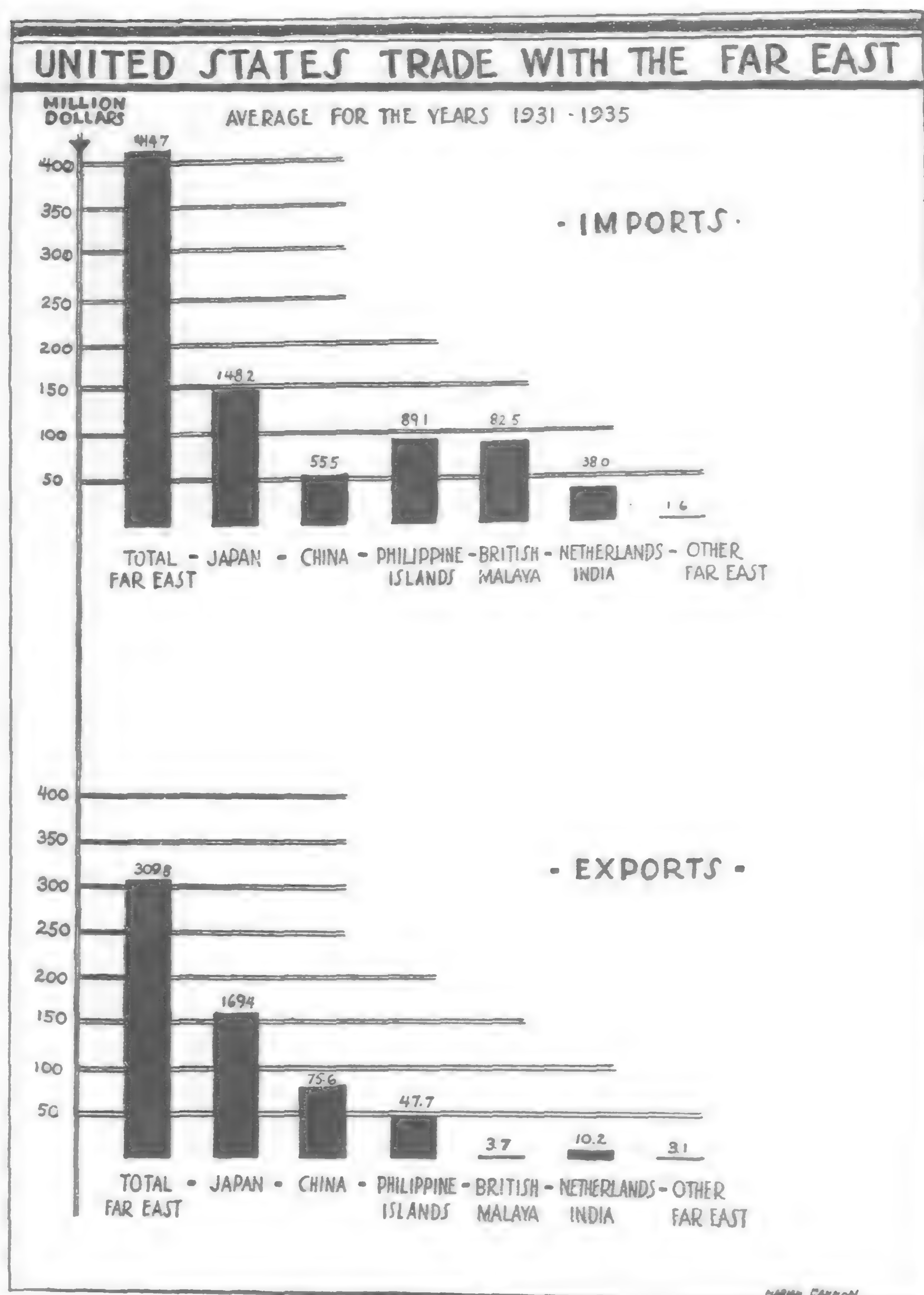
Yet such changes cannot be avoided in the inexorable course of economic evolution. They place squarely before the Western and Eastern nations the question whether the necessary readjustments can be worked out gradually by mutual agreement or whether they must go on embittering an already difficult international situation. Unfortunately, no realistic observer could say that present conditions in the international economic sphere were particularly favorable for such a process of concession, co-operation and compromise. Yet no question is more fundamental than this one to the problem of war and peace.

How Large is Our Far Eastern Trade?

In 1935 the United States did 837 million dollars' worth of business with the Far East. In 1929, our total trade with this region amounted to 1,633 million dollars. What do these figures mean?

The most surprising thing about them is that they are so small—small, that is, in comparison with United States foreign trade as a whole, with the vast areas and populations which they represent, or with the glowing prophecies current a generation ago concerning the unlimited possibilities of trade with the Orient.

A few statistics will serve to clinch and illustrate the point. It is true that our trade with the Far East has been steadily growing for many years, and that it has been growing faster than our trade with other areas, thus increasing its proportional share of our total foreign trade. It is true that in the five years 1931-1935 Far Eastern countries accounted for 19 per cent of the total foreign trade of the United States—24 per cent of the imports, and 15 per cent of the exports. This represents no inconsiderable sum. Yet our entire



trade with the Far East is still only half as great as our trade with the much smaller population of Europe; and in 1935 we sold more goods, by value, to the 11 million people of Canada than to the 700 million or so of the Far East.

Does this mean that the early prophets were wrong, and that the Orient holds no further promise of great commercial expansion? Or is it merely that its greatest possibilities remain untapped? Some light may be thrown on this question by inquiring which among the various Oriental countries have contributed most to the expansion of our Far Eastern trade.

This question is pertinent to our inquiry for another reason also. It is no longer possible to speak of "the Far East" as a relatively homogeneous undeveloped area. Owing to differences in local conditions, the seeds of Western culture, implanted in the East, have grown very unequally. Hence some of the Oriental countries are much more important to us commercially than others. Considerations of this kind weigh heavily in the determination of policy.

With Whom Do We Trade?

Looking at the trade figures from this point of view, we find another striking fact which is in direct contradiction to the expectations of fifty years ago. The overwhelming preponderance of Japan in our trade with the Far East is a fact not always adequately realized. Forty-two per cent of our entire Far Eastern trade is carried on with Japan. More than eight per cent of all United States exports go to Japan, and likewise a little over eight per cent of all our imports are derived from that country. Japan is now our third best foreign customer—exceeded only by Canada and Great Britain (these figures are based on average values for the years 1931-1935).

By comparison, China, the reputed El Dorado of commerce, makes but a poor showing, accounting for only 18 per cent of our entire Far Eastern trade, and slightly more than three per cent of total imports and exports, respectively (this includes Hongkong and Kwantung). Moreover, China's share in our total trade has shown little change since the World War, and in the last few years has actually declined, while that of Japan has notably increased.

It is not difficult to explain why the commercial importance of Japan is so much greater than that of China, despite her much smaller area and population. Japan has, for reasons which we cannot go into here, been able to make herself into a great industrial nation. Her people produce more, per head, than the Chinese. She has more goods to sell and greater need to buy. Her business men are better organized; her laws, her financial system, her facilities for promoting and handling trade are more modern, more efficient, more akin to the methods of the West.

China, on the contrary, remains, from the point of view of modern capitalist economics, a comparatively undeveloped country. She has made a start in the direction of industrialization, but has as yet progressed neither very far nor very rapidly, owing to the hampering influence of domestic and external forces peculiar to China. We shall have something to say later about the prospects for the industrialization of China. For the present only one point need be noted; namely that trade possibilities cannot be computed by

counting noses, or by estimating how much business would be created if every Chinese were to add an inch of cotton cloth to his garment. The experience of fifty years has taught us one thing at least: that the commercial importance of a country is determined not only by its area, its resources, and its population, but also by its political stability, its degree of economic development, its form of economic organization, and the productivity and purchasing power of its people.

This principle is illustrated also in United States trade with the minor countries of the Far East. Third in importance, ranking indeed, little if any below China, are the Philippine Islands. Being under the American flag, they stand in a somewhat different category, but they are no less definitely a part of American economic interests in the Far East. Almost negligible until the advent of free trade in 1909, our commerce with the Islands has grown until it now forms 19 per cent of our total Far Eastern trade. Imports from the Philippines are something over five per cent of all United States imports, and exports to the Islands form rather more than two per cent of all our exports. Thus the Philippines' share in United States foreign trade, though small, is comparable with that of China, whose population is more than thirty times as large.

There is no question that American sovereignty in the Islands has had much to do with the increase in trade. An autonomous development of the Philippines, similar to that which took place in Japan, would have been unthinkable fifty years ago, and the considerable economic development which has occurred is due principally to the stimulus of free trade with the United States, plus that of American investment and the penetration of American culture. As a result, nearly all of the foreign trade of the Islands is carried on with the United States. Whether or not the existence of this trade has been beneficial to the United States is possibly a debatable question, but there is no doubt that if the development of the Islands had taken place under the auspices of some other power, our trade with them would be much smaller than it actually is. Furthermore, during the depression the United States has shared the experience of other empires, which have on the whole been able to retain their trade with their colonies much better than their trade with foreign countries.

Continuing down the list of Far Eastern countries, we may for the moment lump together those remaining—British Malaya, Netherlands India, French Indo-China, Siam, Asiatic Russia and the miscellaneous category of "Other Asia." Taken together, these countries absorb less than one per cent of our exports. Their present importance as markets is therefore negligible. But on the import side, they loom up with considerable significance, furnishing more than seven per cent of all our imports. Tin and rubber from British Malaya and Netherlands India largely account for the comparatively substantial share of these countries in the United States import trade.

Manchuria has been included with China in the above calculations. Being in the limelight, however, it deserves a further word. It is impossible to estimate exactly the amount of United States trade with Manchuria, since only the Japanese leased territory of Kwantung is listed separately in American trade returns. There is also a certain amount of trade with Manchuria through other ports and through China proper, and undoubtedly some part of our imports from and exports to Japan originate or find their final destination in what is now called Manchoukuo. But even if, making an overgenerous allowance, we double the Kwantung figures, we can still allot to Manchuria less than one-third of one per cent of total United States imports and exports, respectively. Manchuria is not and never has been a factor of much importance either in United States foreign trade as a whole, or in imports or exports of more than one or two leading commodities. Nor does the United States have any large investments in Manchuria.

In this itemized account, little has been said of the Soviet Union, which looms so large in the politics of the Pacific area. There is, in fact, little to say. American trade with Soviet Pacific ports is entirely negligible—less than one-tenth of one per cent of our total foreign trade—and that with the Soviet Union as a whole has never reached large proportions. Had we been more willing to meet the Soviet requirements for long-term credits, as Germany and other countries have done, we might in the past have done a fair amount of business with the Soviet government. At present, the trend of Soviet foreign trade seems to be downward, as the growing diversity of production within the Soviet Union enables it to dispense with imports of many things which formerly had to be brought in from abroad. In short, whatever considerations may govern our relations with the Soviet Union, protection of existing trade—or it need hardly be said, of existing investments—is not one of them.

What Do We Import from the Far East?

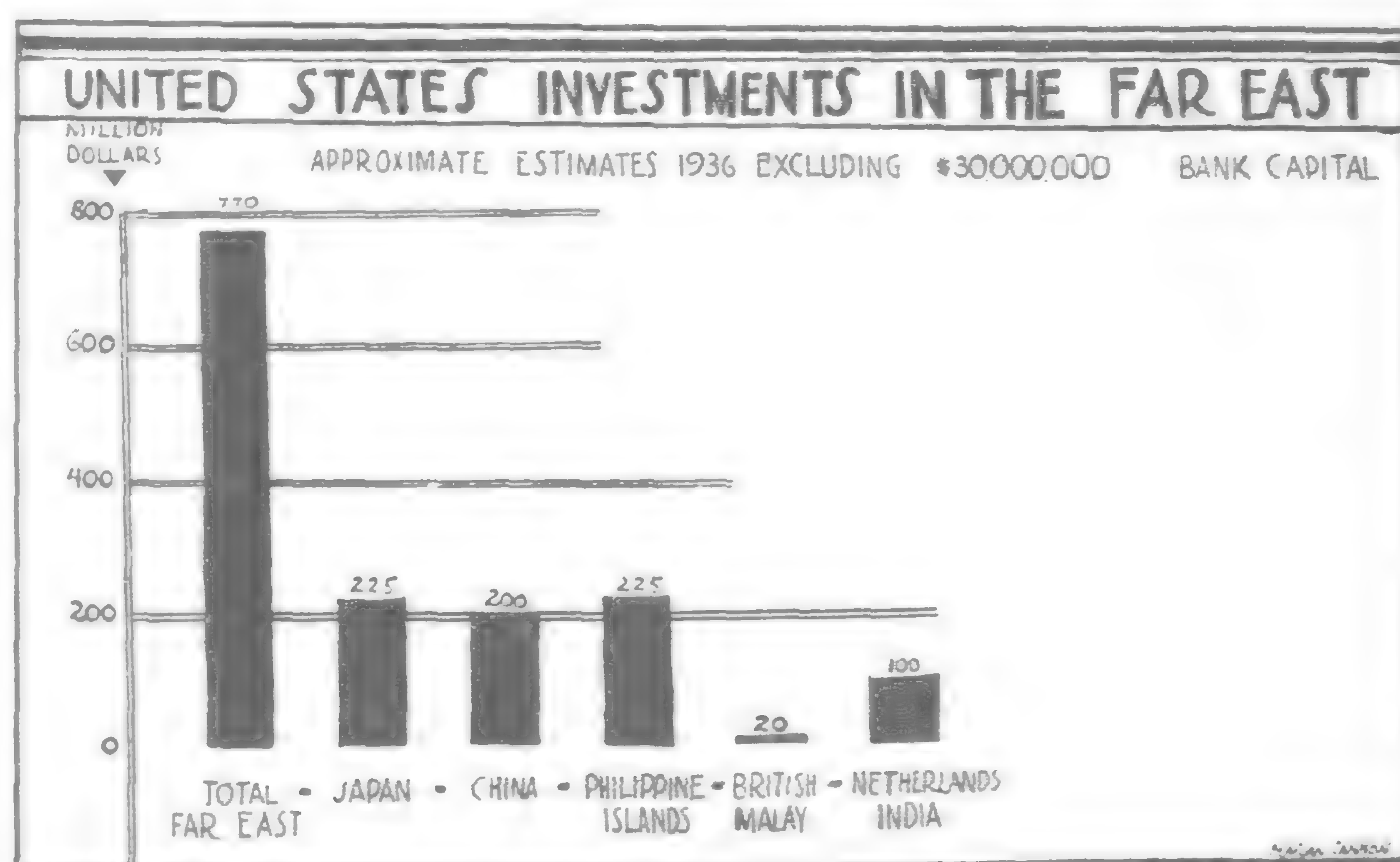
So much attention has been focused upon the actual or potential value of the Far East as a market that its importance as a source of imports has been somewhat obscured. Yet as a matter of fact more than half of our trade with the Far East consists of imports—66 per cent, to be exact, in the pre-depression period 1926-1930. What American industries are concerned with this import trade, either as consumers of Oriental raw materials, or as producers affected by the competition of Oriental goods?

Our imports from the Far East may be divided into three classes: non-competitive, partly competitive, and wholly competitive. The great bulk of the import trade, however, is almost wholly non-competitive. This is easily proved by looking at

the proportion of imports from the Far East which comes in duty-free. The United States imposes a tariff upon practically every kind of goods which could by any stretch of imagination be supposed to compete with any domestic product. Yet in spite of this—or rather because of it—no less than 87 per cent (by value) of all imports from the Far East enter the country free of duty. If imports from territory under the American flag—that is, from the Philippines—be excluded, the proportion is still as high as 83 per cent.

In 1934 the following commodities formed 57 per cent of our total imports from the Far East: rubber, silk, tin, tung oil, tea, copra, spices, carpet wool, Manila hemp, dessicated coconut, palm oil, sisal and henequen. With a few qualifications, it can be said that these commodities compete with no domestic producer. Although we produce no crude rubber and very little newly mined or virgin tin, reclaimed rubber and tin supply around 20 and 30 per cent, respectively, of our total annual consumption of these commodities. The process of reclamation, together with the use of substitutes for some purposes, somewhat decreases our dependence upon foreign sources, and would become very important in time of emergency. But normally and over long periods, we should still have to import large quantities of crude tin and rubber to meet our needs for automobile tires and countless other rubber goods, for tin cans, roofing, and alloys important to industry. Chemists may yet give us cheap synthetic rubber and other substitute products, but for the present the statement stands. Similar reservations might be made about several more of the products mentioned above—e.g. copra, palm oil, tung oil—but on the whole our dependence on foreign sources for these products is fairly complete.

The extent of our dependence on the Far East for these essential raw materials can be measured in figures. About 90 per cent of the crude rubber used in the United States, and 75 per cent of the virgin tin, come from Netherlands India and British Malaya. From 80 to 98 per cent of our raw silk comes from Japan, with a small quantity also from China. All of the imported tung oil used in paint



manufacture and for other purposes, and essential in the making of quick-drying paints and varnishes, comes from China. About a third of our tea comes from Netherlands India, Japan and China. Practically all of our coconut oil comes from the Far East, principally from the Philippines—either as oil or in the form of copra, the dried coconut meat from which the oil is extracted. The Philippines likewise supply practically all of our dessicated coconut. More than a third of our imports of spices is furnished by Netherlands India, China, British Malaya and Japan. A third of our carpet wool comes from China. All of the Manila hemp, the material of high-grade ropes and cables used in shipping, in oil fields and in almost every branch of industry, comes from the Far East, 98 per cent of it from the Philippines. Sisal and henequen, also used in rope-making, are supplied by Netherlands India to the extent of a third of our imports. More than half of the palm oil used in soap-making and for other purposes comes from Netherlands India. A fair proportion of the goat and kid skins (not produced in this country) required for the manufacture of fine women's footwear comes from the Far East, especially from China.

Other examples could be cited of commodities for which the United States is partly or wholly dependent upon the Far East. This dependence constitutes, in fact, the principal significance of imports from the Far East in American economic life. Dependence upon foreign supplies of raw material is sometimes represented as a weakness, but this view can be unduly magnified. There is little ground for apprehension that Far Eastern producers will be unwilling to sell us all we want and can pay for. It is only in time of war that our imports would be in any danger. In such an event, imports from an enemy country in the Far East would, of course, be cut off, but those from other countries would suffer only from such interruption as might occur in seaborne commerce. But since a simultaneous blockade of both our Atlantic and Pacific coasts is practically inconceivable, even in time of war we should not be completely cut off from the Far East, unless we were fighting all the Far Eastern countries at once.

It is sometimes alleged that dependence upon foreign sources involves a danger of being forced to pay extortionate prices exacted through monopolistic control of supply. Whatever the truth in these assertions, the issue is one between private producers and consumers, whether of the same or of different nationalities, rather than a geographical or political problem. Hence it would only confuse the issue to discuss it here.

The second class of imports—those which are partly competitive with domestic production, and partly supplementary to it—also includes many commodities, but the outstanding examples are three of our principal imports from the Philippine Islands—sugar, coconut oil and cordage (ropes and cables). Here we touch closely upon a subject of great international interest, since it is the opposition of certain groups of American producers to the free admission of these products from the Philippines which has been to a large extent responsible for the decision to grant independence to the Islands.

A leading bone of contention is sugar, of which the Philippines have in recent years furnished about half of our total imports and a quarter of our total consumption. In this case, however, our absolute dependence upon the Philippines is not very great. It would take an enormous increase in production of the more expensive beet sugar to make the United States continental area self-sufficient in this important foodstuff, and the output of our territories and dependencies within the tariff wall (Hawaii, Puerto Rico and the Virgin Islands) cannot be indefinitely increased; but we can always count upon the great actual and potential capacity of our neighbor, Cuba, which enjoys tariff preference in the American market and in whose sugar industry, incidentally, United States capital is considerably interested. Philippine sugar thus competes with these American interests.

The situation in regard to copra and coconut oil is even more complicated, but it boils down to two essentials. A certain amount of coconut oil is necessary in the manufacture of soap, and is therefore non-competitive; but any amount used in soap-making above this minimum, as well as oil used in oleomargarine and other products, competes with American animal and vegetable oils. Therefore its free entry is opposed by various agricultural groups. In the second place, American firms which extract oil from copra naturally want to shut out imports of oil, but have no objection—on the contrary—to the widespread use of coconut oil in industry, or to the free admission of the copra from which it is made. Much

the same thing is true in the case of cordage: Manila rope is deemed the best for certain uses, but it also competes to some extent with wire rope, cordage and twine made from other fibers, including cotton. Here again, United States rope-makers want to exclude ropes made in the Philippines, but they must depend for their Manila hemp on the Islands, which have a near-monopoly of world production.

There is no doubt that the exclusion of Philippine sugar, coconut oil, cordage, etc., from United States tariff protection would greatly reduce if not completely eliminate imports of these commodities, thus benefiting American producers of the same or similar goods. On the other hand, it would have very grave effects on the Philippine economy, which has been built up on the basis of free access to the American market. And anything that reduces the purchasing power of the Philippines impairs their value as a market for many American industries, notably the cotton textile industry.

Finally, we come to the comparatively small volume of imports which may be regarded as definitely competitive. Neither individually nor as a group are these items of outstanding importance; but because they are competitive, they are blazoned in headlines while the great stream of non-competitive commerce receives little attention.

This third category consists chiefly of goods from Japan: a medley of small items such as cotton cloth, rugs and waste, canned clams, crab-meat, toys, dishes, brushes, combs, pencils, hats, rubber footwear, matches, electric light bulbs and many more. Often of inferior quality but always low in price, these goods crowd the counters of ten cent stores and bargain basements. Imports of such goods from Japan have increased greatly in the last few years, though the quantities are still small; and loud outcries from American manufacturers have resulted. At the same time Japanese goods have been making inroads on established American markets in other countries, notably Latin America and the Philippines, and this has likewise received a large share of attention in the American press.

Because of the natural objection of American manufacturers to the competition of cheap Japanese goods, the legend of a "Japanese trade menace" has been created. For this reason it is important, from the standpoint either of national interest or of international relations, to view the subject in its proper perspective. It is too complex to be covered in a few sentences, but this much may be said. It is true that prices of Japanese goods are frequently so low as to disturb the market and therefore to have disruptive effects out of proportion to the actual volume of imports. It is true that in the case of a few highly specialized commodities, such as cotton rugs, Japanese products have practically driven American goods out of the market. It is true that in some cases American manufacturers have felt the pinch of Japanese competition abroad. On the other hand, it has been estimated that not more than 10 per cent of our imports from Japan are in any way competitive in character. The leading position of the United States in the import trade of the Philippines and Latin America has not been substantially undermined by Japanese exports. The adverse effects of Japanese competition have not been very serious upon any important American industry. In sum, to quote from a comprehensive study of Japanese-American trade and trade rivalry published by the American Council of the Institute of Pacific Relations, "there is little evidence so far that American industry need fear Japanese competition on a sizable scale in its present markets."

What Do We Export to the Far East?

Foreign trade figures alone give no clue to the true importance of the export of any given commodity. A thousand-dollar order may mean little to a million-dollar industry while its loss might spell ruin for a small producer. But the voice of the big industry may legitimately carry more weight in the determination of foreign trade policy, since thousands of workers depend upon it for a livelihood. And even to a million-dollar industry, a small amount of orders may well mean the difference between profit and loss. Nevertheless, the most important thing to remember about United States exports to the Far East is that, with the notable exception of cotton-growing, no outstanding American industry depends upon the Far Eastern market for the disposal of more than a minute fraction of its total output.

Of all sections of the country, the cotton South may claim the greatest stake in the Far Eastern market. In the 1934-35 cotton

season, no less than 32 per cent of all American exports of cotton, and 17 per cent of the entire cotton crop, was shipped to the Far East. Cotton is not only our leading agricultural industry, but also the one most dependent upon foreign markets. Normally more than half of all the cotton we raise is exported abroad. Europe used to be the great cotton market, but the rise of cotton textile industries in the Far East has meant a shift in world production toward that region, which has consequently become increasingly important to the American cotton farmer. And when we say "the Far East" we mean, for all practical purposes, Japan. The Chinese market for American cotton is small and declining, and the Chinese cotton industry seems to be rapidly passing into Japanese hands. But the recent remarkable boom in Japanese exports of cotton textiles has greatly increased the Japanese demand for foreign cotton, making Japan about the only bright spot on the horizon of the American cotton farmer. The gains to American trade from this increased demand for raw cotton probably outweigh any losses in American cotton textile exports which can be ascribed to Japanese competition.

Japan has lately been making strenuous efforts to develop other sources of cotton, in order to reduce her dependence upon the United States for this raw material which is as vital to her as silk, tin and rubber are to us, if not more so. The high price of American cotton induced by the AAA is sometimes cited as having influenced these efforts, but strategic factors have doubtless played a part also. So far, these efforts have borne little fruit, but in North China there are large areas suitable for cotton cultivation, and both the Chinese government and Japanese interests are trying to improve the quantity and quality of the crop. Many difficulties stand in the way, and great changes cannot be accomplished over night, but it is possible that in time cotton from North China may to some extent supplant American cotton on Japanese as well as on Chinese spindles.

A second agricultural group having a considerable stake in the Far Eastern market consists of the tobacco growers, particularly the producers of flue-cured tobacco in Virginia, North and South Carolina, Georgia and Florida. But this market is definitely declining. As recently as the 1928-29 season, Far Eastern countries, notably China, absorbed no less than 19 per cent of the entire American flue-cured crop; in the 1934-35 season it took only seven per cent. The growth of tobacco production in China, the decline of Chinese purchasing power (in part due to the world depression), and tariff and taxation policies favoring the use of native tobacco, are mainly responsible for the sharp falling-off in American tobacco exports to the Far East. The market for American tobacco in Japan is smaller, but more stable; that in the Philippines, however, is likewise threatened by the development of domestic production.

As for wheat, the third major agricultural export to the Far East—whose markets are especially important to the farmers and millers of the Pacific North-west—the paradoxical situation exists of exports to the Far East becoming more important, relatively, at the same time that they are declining. The fact is that American exports to Europe have fallen even more rapidly than those to the Far East, because European countries have made more rapid advances toward national self-sufficiency in wheat than those of the Far East—though the contemporary tendency to seek such self-sufficiency has affected both continents.

To Japan, we ship wheat grain; to the Philippines, flour; to China, both. In all three countries efforts are being made to develop domestic wheat production. Japan is now practically self-sufficient in wheat, but still imports some grain, which enables her to export flour to Manchuria, China, etc.—competing, of course with American flour exports. China's wheat consumption has been reduced by the decline of purchasing power among the people, but may rise again if and when prosperity comes; but here, too, self-sufficiency is being sought for. In view of this fact, as well as of the competition to be expected from Canada and Australia, experts see little prospect at present of any great revival of wheat exports to China, unless they should be artificially stimulated (as has been done recently on several occasions) by loans and export subsidies. The Philippines are trying desperately to reduce their imports in order to meet the crisis which will overtake them if and when their economic connection with the United States is finally severed, but it is uncertain whether their climate will permit them to raise their own wheat. On the whole, there seems at present to be little prospect that American wheat exports to the Far East will in the future rise much above their present level of less than one per cent of total American production.

Industrial exports to the Far East are much less important, both in value and in relative significance to the producers. The chief industrial group having a considerable stake in the Far Eastern market is the petroleum industry, and even here exports to the Far East represent no more than around two per cent of total American production of refined oils. China is a fairly large customer for American kerosene, Japan for crude oil, gasoline and fuel oil, the Philippines for gasoline and kerosene. Since none of these countries is known to possess any extensive deposits of petroleum, and since their need for liquid fuel will probably grow with the progress of industrialization, their demand for petroleum products may be expected to remain substantial.

The iron and steel industry, and allied industries such as automobiles, turbines, aeroplanes and machine manufacture, have also some interest in the Far Eastern market. Japan's industrial boom and her development of Manchuria have greatly increased her purchases of American iron and steel products, though at the same time leading to an expansion of her own iron and steel industry which is likely to reduce her future demand for foreign steel products to a comparatively small list of specialized items. The progress of industrialization in China, the Philippines and other Far Eastern countries, if not interrupted by untoward events, may be expected to lead to a greater demand for machinery and other capital equipment.

Many other producing groups, of course, besides those mentioned above, have a share in the Far Eastern market. Some of the more important may be indicated by simply listing the following commodities which figure prominently in the list of exports: condensed milk, canned fish, and numerous other preserved foods, which are especially in demand in tropical countries; lumber, particularly Douglas fir and Western cedar from the Pacific Coast, most of our exports of which go to Japan; wood pulp, of which again, Japan is the principal buyer; paper and its manufactures, which go mainly to China and the Philippines; rubber tires and other manufactures of rubber, of which the Philippines are the chief though not the only Far Eastern purchaser; copper and its manufactures, taken largely by Japan; coal tar dyes, for which China is the leading Far Eastern market; chemicals, including agricultural fertilizers; and photographic goods, including movies.

It is our farmers, then, rather than our manufacturers, who may claim the largest stake in the Far Eastern market. In addition to the many producing groups which have a larger or smaller stake in the Far East as buyers or sellers, only the most important of which have been mentioned here, there are many other groups whose interests are closely bound up with Far Eastern trade: import and export houses, brokers, warehouses, shipping and railroad lines, banks and insurance companies. All of these together make up a body of American opinion which is keenly interested in questions of foreign trade in general and trade with the Far East in particular.

The Balance of Trade

A final note should be added with regard to our balance of trade with the Far East. Although the significance of merchandise trade balances with particular areas is often over-estimated, there are a couple of points worth noting. The large excess of imports, to which reference has already been made, results in a balance of merchandise trade between the United States and the Far East as a whole (and usually with the principal countries individually) which is passive—or "unfavorable," but the latter term is misleading and therefore to be avoided. But for total United States foreign trade, the balance has for many years been active—the excess of imports from the Far East being more than balanced by an excess of exports to other parts of the world.

This is significant in two ways. The Far Eastern countries—notably the British and Dutch colonies—have used the proceeds of their active trade balances with the United States to pay the interest and dividends on foreign investments in their respective countries, which payments go largely to Europe. American purchases of rubber, tin and so on have thus played an important part in the settlement of international balances of payments.

Secondly, the Far East is the only large geographic area with which our trade relations are those appropriate to a creditor country. Economists have been telling us for years that the United States ought to have a passive balance of merchandise trade, since it is a large international creditor and in the last analysis can receive payments of interest and principal only in the form of goods and services.

It is thus evident that if an increase were to take place in our exports to the Far East without a corresponding increase in imports—or, conversely, if imports were to decline while exports did not—the result, in the absence of compensating changes in the trade of Far Eastern countries with nations other than the United States, would be to throw sand in the wheels of the delicate mechanism by which international payments are balanced, and to intensify the difficulties caused by the refusal of the United States to let its debtors pay in goods. This is not to say that such a relative increase in exports would not be desirable, but only to suggest that in formulating foreign trade policy account must be taken not only of direct effects but also of indirect repercussions upon international economic life, which in turn react upon the United States.

American Investments in the Far East

A group of American residents in the Philippine Islands puts a little money in a gold mine. A midwestern bank buys a bond of the City of Tokyo. The United States Rubber Company organizes a subsidiary to develop rubber plantations in Netherlands India. The Singer Sewing Machine Company sets up a branch in Yokohama. An American resident of Shanghai becomes an operator in the local real estate market. A group of Wall Street banking houses, with the assistance of the State Department, gains the right to participate along with British, French and German bankers in an issue of Chinese railway bonds. A missionary society builds a school in Chengtu. A philanthropic organization constructs a hospital in Peiping.

By such transactions as these has our investment stake in the Far East been built up. All of these people, except the missionaries and philanthropists, expect to make a profit on their investment. The latter for the most part do not believe in requesting protection from the American government. They realize the inconsistency of introducing Christianity and sanitation at the point of a gun, and prefer to carry on their work by gaining the sympathy and confidence of the Orientals. It is purely economic investments, therefore, which raise the question of how far they should be protected, if necessary, by the diplomatic and naval arms of the government.

American investments in the Orient appear small when compared with the total of American foreign investments, or with the total of American investments both domestic and foreign, or with the investments of other countries in the Orient. It is extremely difficult, in fact impossible, to get any exact account of American investments in the Far East. Any figures given here must, therefore, be regarded merely as the best guess which can be made on the basis of the actual facts which are available. But even a rather large error one way or the other would not affect the truth of the generalization stated above.

In round figures, the sum of all American investments in Far Eastern countries may be put at not more than 800 million dollars. That is an outside figure; 750 million is probably nearer the truth. This includes the property of Americans residing abroad as well as of those living in this country. Since 1930, the sum has declined by perhaps 300 million dollars, which is partly a depression and hence presumably a temporary phenomenon, but partly the result of Far Eastern countries—especially Japan, Netherlands India and the Philippines—having either paid off or bought back their own securities held by American nationals.

How much is 750 million dollars? It is about five or six per cent of the total foreign investments of the United States. It is considerably less than the sum of British investments in China alone, and about equal to Japanese investments in Manchoukuo. It is about half as great as the book value of all properties owned and operated by a single American corporation—United States Steel. It is a little more than the sum paid by the American public to manicurists, barbers and hairdressers in 1929. It is well below the national defence budget of the United States in 1936. In other words, in terms of national wealth the sum is clearly very small.

In what countries are these investments concentrated? As between China, Japan and the Philippines the division is nearly equal: about 225 million each in Japan and the Philippines, and about 200 million in China. Investments in Netherlands India are estimated roughly at 100 million, and those in British Malaya, French Indo-China and Siam together, at around 20 million. The balance of 30 million, making up our outside figure of 800 million in all, consists of bank capital for which we do not know the allocation among the different countries.

Of what do these investments consist? Two categories are recognized by economists, which are essentially different in nature and hence in the problems which they create. These are portfolio investments and direct investments. Portfolio investments are paper: foreign stocks and bonds held by American individuals and financial institutions. Direct investments are actual property in foreign countries, such as branch factories, mines and plantations held by industrial and commercial corporations. Holders of portfolio investments are keenly interested in receiving their interest or dividends, and bring pressure to bear when necessary to secure their payment, but holders of direct investments, or their agents, actually go into the foreign country and take part in its economic life. Their interest in the preservation of peace and order is therefore even more keen.

American investments in Japan consist chiefly of portfolio investments: bonds of the national government, municipal governments and public utilities. It is interesting to note that American investors, through the purchase of 40 million dollars of gold debentures issued by the government-controlled Oriental Development Company in 1923 and 1928, have assisted the Japanese Government in the economic penetration of Korea, Manchuria, Mongolia, China Proper and the South Seas. But a comparatively small part of the Japanese national debt is held by foreigners, and no foreign loans have been floated in recent years.

American direct investments in Japan amount to only about 60 million dollars. They include selling agencies for American products, and branch plants for the manufacture of electrical equipment, automobiles and chemicals. Both Ford and General Motors have assembly plants in Japan which, using parts imported from the United States, supply most of the Japanese market for motor-cars, and American oil companies do a large business in Japan. The recent drive for self-sufficiency in that country, has, however, reacted on the American automobile business through the enactment of a law which, while permitting the American companies to continue, provides that any expansion in the industry must be by Japanese-controlled companies. This suggests that in the future American investments in Japan are likely to take the form of minority interests in Japanese corporations, such as have already been acquired by many American firms in exchange for patent rights.

American investments in China, on the other hand, are mainly in properties owned and operated by Americans, that is, direct investments. American investment in Chinese government bonds has been neither very large nor, it may be added, very successful from the financial point of view. As a matter of fact, the figures given above do not include certain Chinese government obligations which are regarded as unlikely to produce any returns in the future. And China has not developed her own corporations to any great extent, so that there is less opportunity for minority participation by Americans than exists in Japan. Indeed, the larger part of all foreign investments in China consists of business properties entirely controlled by foreigners.

Professor C. F. Remer, the leading American authority on the subject, estimated in 1932 that 32 per cent of all American investments in China was in the import and export trade, in which about one hundred firms were engaged. Twenty-three per cent was in public utilities, including the Shanghai Power Company, which has a monopoly of the power business in Shanghai and is controlled by the great American concern, Electric Bond and Share; and the Shanghai Mutual Telephone Company, controlled by the International Telephone and Telegraph Company. Seventeen per cent was in banking and finance, including branches of the National City Bank, the American Express Company, and the Equitable Eastern Banking Corporation. Fourteen per cent was in manufacturing, including factories making Chinese carpets, electrical equipment, wood products, cigarettes, egg products, etc.—some of which are obviously for export. Seven per cent was in transportation (railways, motor-cars, aviation, shipping); six per cent in real estate; and less than one per cent in mining. No less than two-thirds of the total American investment in China is centered in the foreign-controlled city of Shanghai; a large part of the remainder is in Tientsin.

Since Professor Remer wrote, there have been developments of some significance in the field of aviation. An aeroplane factory, controlled by the Curtiss-Wright Corporation and the Douglas Aircraft Company, has been established in Chekiang and is turning out planes for the National Government of China under a five-year

contract. In addition, the China National Aviation Corporation, the leading operator of air lines in China, is owned 45 per cent by Pan-American Airways, the remaining and controlling interest being held by the National Government. Taken in conjunction with Pan-American's newly established trans-Pacific route, the strategic position occupied by this American company in China may be of considerable significance for the future. Incidentally, both of these companies have their political implications, since the indirect result of their activities may be to provide China with a potent weapon of resistance to Japanese encroachments.

In the Philippines, American investments are about equally divided between bonds and direct or business investments. The bonds are mostly those of the Philippine government, but also include those of railways and public utilities. Direct investments are scattered through a large variety of industries, including sugar, coconut, abaca (Manila hemp), embroideries, merchandising, real estate, lumbering and mining. Although American investments in agriculture are slight in comparison with those of Filipinos, the industrial life of the Islands is dominated by American capital.

All of these investments, of course, may be in danger if and when the Islands are cut off from the American tariff area, though the government bonds are fairly well secured by provisions in the Tydings-McDuffie Act which are expected to guarantee full repayment by the time complete independence arrives. If, however, some sort of economic tie is retained, the Philippines will continue to be a field for American investment.

A few years ago Americans held fairly large amounts of Netherlands India dollar bonds, but the last of these was retired in 1934. At present, therefore, American holdings in Netherlands India, and in British Malaya as well, consist entirely of direct investments: rubber plantations, oil wells and tin mines. The largest single investment in south-eastern Asia is that of the Standard-Vacuum Oil Company, a subsidiary of the Socony-Vacuum Oil Company and the Standard Oil Company of New Jersey. Its properties in Netherlands India are now valued at 70 million dollars—against which may be placed those of the Royal Dutch Shell Company, valued at approximately 435 million dollars. This single British-Dutch corporation thus has a larger stake in the Far East than that of all American investors in China and Japan combined.

Perhaps the most significant aspect of American investments in the Far East, from a purely economic standpoint, is the stimulating effect which they exercise on trade: through direct financing, through the building of factories in the East by Americans with American materials, etc., but primarily through the broad influence exercised by foreign investments in stimulating the economic development of the Eastern countries. But since American investments in this area have been comparatively small, their effect on trade has been correspondingly slight; in fact, American trade has benefited more from the investments of other countries in the Far East than it has from American investments, since the former have been so much larger and their effects on trade consequently greater.

Trade and Investments as Sources of Conflict

American trade with and investments in the Far East are, it has already been shown, part of the general impingement of the Occident on the Orient, which is sometimes described as imperialism, and which has made the Far East a fertile field of national and international conflict.

The impact of Western civilization has introduced numerous stresses and strains within the Eastern nations themselves. In those countries whose economic status is colonial or semi-colonial, and most notably in China, the introduction of Western capitalist methods has broken down the old economic order without, as yet, creating anything to take its place. The application of foreign capital to the development of the resources of these countries has been carried on in the main by foreigners and with the primary object of making profits for foreigners, rather than of building up a sound and balanced economy within the respective countries. Capitalists who frequently display little sense of social responsibility at home give even less attention, when operating abroad, to the consequences of their activities upon the populations to whom they are bringing often unwelcome innovations. Cheap foreign goods have ruined native industries. Few labor laws have protected native workers employed by Western-owned factories. Foreign control has made the tariff an organ of protection to foreign rather

than to native interests. The debtor position of Eastern countries has made them economically dependent upon their Western creditors. Formerly self-contained nations have been brought into the orbit of modern capitalist economy, which has heightened their productive powers but has at the same time made them peculiarly sensitive to all of the disturbances arising in that economy. All of these things have produced a smoldering resentment against the foreigner, which flares up periodically and will doubtless continue to do so as long as foreign control remains.

In Japan, alone of the Far Eastern countries, modern capitalism has reached the adult stage if not that of complete maturity. We have already pointed out the conflicts and readjustments which such a process necessitates in the field of international trade, which may be summed up in the word "competition." And Japan too is subject, in a deeper sense, to the trials which beset all advanced capitalist nations: fluctuating prices, agricultural depression, conflict between capital and labor, the cycle of prosperity and depression. The pressure of a growing population upon meager natural resources, and the social and political strains arising out of the fusion of the new industrial order with the old traditional habits, have set up currents of inner conflict. Powerful social and political forces are impelling Japan toward a course of national expansion, which brings her into conflict with the interests of older imperialist nations in China and southeastern Asia.

The impact of the West has thus made the Far East an extremely unstable area both economically and politically. To this demoralizing influence on international relations must be added the more immediate seeds of conflict found in the rivalries among foreign powers—with which must now be included Japan—for spheres of influence and a share in investments and trade. The history of the Far East affords many examples of how legitimate measures for the protection of legitimate interests—legitimate, that is, by commonly accepted standards—may easily and even unintentionally lead to critical international situations involving the danger of a war costing far more than the value of all the concrete interests at stake. It is easy to resolve to go so far and no farther, but the resolution is often difficult to keep. In so far as it involves such a danger, America's stake in the Far East must be regarded as a liability rather than an asset.

The Cost of Protection

This leads to a consideration of the costs of maintaining America's stake in the Far East, a complete discussion of which would carry us far beyond the boundaries of the present essay. It is impossible to draw up any sort of balance sheet, neatly canceling off the profits and losses of any given national policy. Too many items are unrecorded; too many are altogether intangible; there is too much room for debate about what belongs where. How much is national honor worth in dollars and cents? How many soldiers may be sacrificed to protect one civilian, or one bank, or one school? How much of our expenditure on armaments is for the purpose of defending our own shores? How much is for the purpose of maintaining the international prestige of the United States, and thus supporting our general foreign policy? How much should be charged to the direct protection or the direct or indirect promotion of our commercial interests? Or are all of these elements inseparable? Are armaments expenditures a net loss, economically speaking, or have they a legitimate secondary function in providing employment and industrial profits?

In spite of the many qualifications with which they must be surrounded, the mere juxtaposition of certain figures throws an oblique light on the problem, and serves as a starting-point for various arguments.

The approximate annual cost of those agencies of the Departments of State, Commerce and Agriculture which have to do directly with the Far East, whether located in Washington or abroad, may be placed at \$1,200,000. Direct army expenses in the Far East are about \$11,000,000. Something, probably a large sum, should be added for that proportion of the general army budget, running annually around \$500,000,000, which may be allocated to Far Eastern affairs; but the proportion is impossible even to guess at. The same may be said of naval expenditures, but here we are on somewhat firmer ground, since it is undeniable that a large portion of our naval expenses is directed toward the Far East. How much, is debatable; it can be maintained with much reason that the United States navy is now primarily intended for possible use in

the Pacific, and that nearly all of the naval budget (which amounted to \$654,750,000 in 1936) should be allotted to this area. However, if we take the very conservative figure of 50 per cent, we find ourselves with a naval item of \$327,370,000 to add to those above. This makes a grand total of \$339,570,000 as the annual cost of maintaining our Far Eastern policy—the great bulk of which is naval expenses.

Beside this may be set the figures of United States trade with the Far East—\$837,020,000 in 1935—and investments in the Far East—about \$750,000,000. How much profit these enterprises bring in is highly conjectural. For the sake of a concrete figure, let us say ten per cent on trade—to cover all the different transactions involved—and six per cent on investments. This gives \$83,702,000 annual profit on trade and \$45,000,000 on investments, a total of \$128,702,000, or about one-third of the expenditures for maintenance described above. But this is still high, for the navy can with difficulty be considered an asset in promoting our trade with Japan, or with the countries of southeastern Asia. If, therefore, we consider the naval expenditures as applying only to China and the Philippines, we may roughly estimate the annual returns in the neighborhood of \$48,000,000 or about one-seventh of the annual expenditure.

Any such figures are wild approximations, and it is not contended that they have any scientific value. But it is evident that any purely economic balance sheet which might be constructed would show a deficit. On the other side are the intangible objectives of policy, such as defence of national territory, honor and prestige, preservation of peace, and advancement of democratic ideals and institutions. Are they worth the cost involved? Are they, on the other hand, best defended by force or the threat of force?

Several further questions are raised by this inquiry. To what extent is the existence of the navy a help to the business man and diplomat in their efforts to promote American trade, and to what extent is it an actual hindrance? May we reasonably expect that the influence of the navy will contribute toward a future increase in American trade and investments sufficient to justify the present expenditure of large sums which bring in no immediate return?

The Future of Our Stake in the Far East

Prophecy concerning the future of our Far East stake is uncertain at best. When experts disagree, the layman finds himself in a quandary. But we can at least examine some of the principal factors which will be likely to affect the destiny of United States interests in the Orient. For this purpose trade and investments may be considered together.

The first factor has to do with the industrial development of Japan, which is at present our best Oriental customer. Japan has in the last few years been experiencing a period of apparent prosperity, dramatically signalized by the enormous expansion of her exports, and appearing all the more remarkable by contrast with the depressed conditions prevailing in most other countries. But this prosperity has been one-sided; it has been confined to a few classes of the Japanese population, bringing little benefit to either laborers or farmers; and it is essentially precarious, containing within itself possible causes of future dislocation. Some people think that the era of rapidly expanding exports is drawing to a close, and even go so far as to say that sooner or later the Japanese economy must crack under the strain of mounting military expenses. But this may be too gloomy a view.

In any case Japan's industrial future is of great interest to the United States. We have seen that heretofore the development of Japan as an industrial nation, while it has injured American interests at some points, has on the whole meant larger opportunities for American commerce. If Japan continues to gain in industrial power, this tendency might be expected to project itself into the future. If, however, international economic conditions are such as to force Japan to continue her present determined quest for national self-sufficiency, an opposing force will be set up which may partly counteract the effects on trade of the growth of Japanese demand. To make the specific application of this point to American policy, if we are thinking of raising barriers against imports from Japan, we must balance the gains accruing to certain American groups from such a policy against the probable harmful effects on other groups which export to Japan.

A second, possibly more important, factor, concerns the industrialization of China. We have seen that the failure, so far, of

the "vast potential market of China" to become an actuality can be ascribed to the fact that China so far has remained largely a country of traditional small trades rather than of large-scale modern enterprise. The lack of a strong central government, recurrent civil wars, the ravages of flood and famine, and above all the fact that so great a part of what modern economic enterprise there is in China is controlled directly or indirectly by foreigners, together with other factors deeply embedded in the nature of the older Chinese economy, have held back the development of a strong native industry. More recently, the world depression has accentuated the already severe hardships of the Chinese people, whose economic situation has become little short of desperate.

On the other hand, the National Government of China is making a strong effort to build up the bases of a sound industrial structure. Considerable progress has been made in recent years in the building of roads and railroads—partly for strategic purposes, it is true—in the stimulation of native-owned industries, in the scientific development of agriculture. But what has been done is only a small part of what must be done to make China a prosperous and self-reliant country. The strangle-hold of foreign control over banking, commerce and industry has not yet been broken. In view of the uncertainties created by the latest phase of foreign penetration in China, this time by Japan, it is impossible to predict China's industrial future. Many people believe that the economic reconstruction movement sponsored by the Nanking Government marks the beginning, at last, of the long anticipated Chinese renaissance. Others think that the obstacles are too great, and that the dawn of a strong, independent, modernized China is not yet in sight.

Closely bound up with this question is the problem which is of most immediate concern to Americans with a stake in China: namely, the problem created by the apparent intention of Japan to exercise economic as well as political hegemony over the whole of China, to build up an economic bloc in which the resources and markets of China will be geared to the industrial needs of Japan. Evidence of this is seen on every hand, not only in the military operations conducted by Japan in North China, but in countless incidents in the economic sphere.

Of broader significance are recent indications of Japanese official policy: the reiterated demand that the Chinese government suppress the boycott of Japanese goods and other anti-Japanese manifestations; the virtual ultimatum delivered by Mr. Amai of the Japanese Foreign Office in April 1934, to the effect that Japan would oppose any operations of foreign powers in China, such as financial or technical assistance, which might be regarded (by Japan) as prejudicial to Japanese interests—an ultimatum subsequently modified but not wholly withdrawn; the indications of Japanese influence in the latest revisions of the Chinese tariff; the Japanese-condoned smuggling of goods into North China through the "autonomous" area of East Hopei; and the recent statement by the Japanese ambassador to China to the effect that something might be done about smuggling if China were prepared to make "reasonable" adjustments in her tariff.

Three issues of the highest importance for American interests in the Far East, and for the future of international relations in the Pacific area, are presented by Japan's drive for control of China—for which, it must be remembered, good and sufficient reason if not justification can be found in the internal situation of Japan. These are: first, whether Japanese penetration will bring peace and prosperity to China, or war and chaos, with the possibility of social revolution; second, and closely related, whether the industrialization of China, if it is to take place at all in the next generation, will take place under Chinese or Japanese auspices; and third, whether the economic development of China under Japanese influence, if it occurs, will or will not be inimical to the interests of other foreign powers, including the United States.

With regard to the third and most immediate issue there are two schools of thought, both of which can bring plausible evidence and arguments in support of their contentions. One asserts that Japan will as rapidly as she can close what remains of the Open Door, adjust the Chinese tariff to suit her own purposes, shut out foreign commercial interests by various devices such as the oil monopoly already established in Manchoukuo, and put a ban on foreign investments in China. The other is equally confident that the probability of such actions has been exaggerated, and that any restrictive effects that may occur will be more than counterbalanced by the growth of demand for foreign goods—food, raw materials and capital equipment—to be expected both from a developing and

prosperous China, and from a Japan stimulated by her own share in this process. The net effect, they claim, will be to create new opportunities for the commerce of other nations as well as of Japan, and whether this trade passes to China directly, or through Japan, is largely immaterial.

Another possibility, which though perhaps remote at present must nevertheless be borne in mind in speculating on the future of China, is that of replacement of drastic reorganization of the present government as the result of a popular uprising combining the forces of anti-Japanese sentiment with the latent but powerful currents of social revolution. Peasant misery has already produced the so-called Chinese Communist movement, which though differing in many respects from the Russian variety, because of the different conditions under which it operates, nevertheless aims, at a fundamental reconstruction of Chinese society in the interest of the masses. Harried by the forces of the National Government, the Communist movement has not been extinguished, and still controls considerable areas in the interior. Its present program calls for co-operation with any and all groups willing to join with it in resisting foreign aggression. Many patriotic Chinese, indignant at the lack of opposition to Japanese encroachments, and aware of the need for some sort of social reconstruction in China, feel that the Nanking Government no longer represents the best interests of the Chinese people, and that China's only hope lies in the formation of what they term a truly popular government. For the financial and moral assistance which such a government would need, they naturally turn to the United States, among others, arguing that America's own interest should lead her to support the forces in China which oppose Japanese domination.

It is of course debatable whether any such moves on the part of the United States would in the long run be beneficial either to China or to this country. But in trying to appraise the future developments which may affect America's existing stake in the Far East, account must be taken of the long-range possibility of the development of China along Communist or semi-Communist lines. If Russian experience is to be taken as a guide, such a development would, at least at first, create an enlarged demand for American goods, in particular machinery and other capital equipment, provided America were willing to finance the trade by generous credits. But conditions in China are so different that such an analogy cannot be drawn with any certainty.

The future of America's stake in the Far East, then, depends upon the economic future of the Far Eastern countries—notably China and Japan. But it also depends no less closely upon the economic future of the United States. Here, again, prophecy would be imprudent, but a few pertinent questions may be in order. Is there any evidence that America will in the near future be able to consume all that she produces? Is there any prospect that technological progress will soon enable her to dispense with rubber, tin and other imports from the Far East to make up deficiencies in her own natural resources? What possibilities are there, and what actual probabilities, of changes in the present uses of land, labor and capital to or from industries that rely heavily upon foreign markets or raw materials—for example, a shift in the South to some other crop than cotton, or an expansion of investment in the automobile industry, which both buys from and sells to the Far East? Is there any sign of strong public support for a policy of self-containment, in difficult practice as well as in easy theory? Or is the interest in and pursuit of foreign markets as strong as ever? Has the United States, and is it likely to have in the future, a surplus of investment funds which will lower interest rates at home and stimulate the search for more profitable fields of investment abroad? Does the future hold a promise of restored prosperity, or of recurrent depressions which will intensify the strain of competition in international markets?

These questions admit of no easy answers. But the answers have a bearing upon the future of economic, and hence of political, relations between the United States and the Far East, which cannot be disregarded.

A Vest-Pocket Summary

A vest-pocket summary of America's economic stake in the Far East would run something like this. The United States is absolutely dependent upon the Far East for part, and in some cases all, of its supplies of a number of important raw materials essential to the functioning of its industrial apparatus. New discoveries in

technology, such as cheap synthetic rubber, or shifts in world production, such as expansion of tin mining in Bolivia, may some day make our reliance on the Far East less complete; but this lies in the realm of future uncertainty. As a market, the Far East is of vital importance to the cotton South, and of some importance to a considerable number of other agricultural and industrial producers. Except in cotton and possibly in tobacco, the Far Eastern market is but a minute fraction of the total market for any important American industry. But we are often told that it is just such minor fractions which make the difference between profit and loss. American investments in the Far East are important to their individual holders, but insignificant in the vast total of all American invested capital.

The returns from our trade and investments in the Far East are not commensurate with the vast expenditures, chiefly naval, which we make, at least in large part, for their protection. But if the Far East is *necessary* to the United States as a source of imports, as a market, and as a field of investment, the question of costs versus gains must be viewed in a broader light. It is in such a perspective that questions of naval expenditure and political policy must be considered.

The purpose of this article being to inform rather than to convince, to raise issues rather than to settle them, it is appropriate to conclude with a series of questions.

Could the United States conceivably abandon all or most of its present economic interests in the Far East? Or is continuance, or even expansion, of the present level of trade and investments necessary to the maintenance of our prosperity and, perhaps, of our economic system? Does even continuing, let alone seeking to expand, our economic stake in the Orient mean our becoming entangled in political developments in that part of the world, with consequent risk of war?

Depending on your answer to these questions, should the United States pursue its traditional policy of promoting and protecting American trade and investments in the Orient? What methods of pursuing this end—peaceful or forcible, national or international—are most effective and least costly? Would such a reassertion of America's economic interest in the Orient promote or hinder world peace? Or should America withdraw so far as possible from the Orient? What, in other words, is in your opinion the most desirable Far Eastern policy for the United States? What changes, if any, would it require in the realm of domestic policy? Irrespective of its theoretical desirability, what policy is most likely actually to result from the present balance of social and political forces within the United States?

New Chinese Railway Planned

Another new line of great communication, economic and military significance is expected to be added to China's railway network in the near future, as the Honan Provincial Government has formulated plans for the construction of a railroad to link up Hsinyang on the Peiping-Hankow line with Yehchiachi on the Honan-Anhwei border.

The projected line, measuring 260 kilometers in length, is in fact the western section of the Wuyi-Hsinyang Railway. When completed, it will link up with the Peiping-Hankow Railway at Hsinyang and the eastern section of the Wuyi-Hsinyang Railway at Yehchiachi. The latter section will, in turn, link up with the Tientsin-Pukow Railway at Wuyi, Anhwei, and the Huainan Railway at Hofei, Anhwei.

Its construction expenses have been estimated at \$11,000,000. To raise this amount the Honan Provincial Government is seeking the approval of the Executive Yuan for the issuance of bonds, amounting from \$15,000,000 to \$20,000,000.

The completion of the railway, it is pointed out, will facilitate military operations against "Red" bandits on the Honan-Hupeh-Anhwei border. From the standpoint of national defence a line connecting the Tientsin-Pukow Railway with the Peiping-Hankow and Huainan Railways will be of utmost importance.

It will also facilitate the development of the natural resources in the Yangtze River and Hwai River valleys.

The Manchoukuo State Railways

PART II

(Concluded from October Number)

As practical means of realizing these various enterprises the General Direction has established the following institutions which will be explained in the pages to come: Railway Guards, Railway Protective Village, Local Enterprises, Education and Sanitation.

Railway Guards

That China has long been famous for her bandits needs no recapitulation. Manchuria, under Chinese influence has had her share of outlaw element.

With the collapse of the Chinese Military rule at Mukden, following the September 1931 Incident, a large number of Chinese soldiers turned bandits and harassed the country side. One of the first targets of the bandits was the railway. Although the Nipponese troops were commissioned to conduct a general campaign against the lawless groups, attacks on the railways were met by railway guards co-operating with the troops. The stationing of railway guards at vital points and on an efficient basis became necessary.

There were several thousand railway guards before the establishment of the General Direction, but they had not been properly trained to effectively protect the railways and maintain peace and order along the railways. Therefore, the General Direction first of all unified all the separate units of the guards on the respective railways to come under one "Railway Police Department," so as to efficiently control the whole system, and assigned the policing of the so-called "Railway Protective Village," elsewhere explained, as well as of the railways to this department.

With the approach of warm season soon after the establishment of the General Direction several groups of bandits commenced to move towards the railways. Trains and railway properties were attacked on many occasions, resulting, in certain instances, in the kidnapping of passengers and employees and destruction of tracks and bridges.

To cope with the situation the General Direction organized a "Committee for Accident Prevention" which considered ways and means to prevent bandit attacks on the railways and after successive deliberation drew up counter measures, such as, are given below:—

1. The operation of pilot trains.
2. Sudden change of train schedule.
3. Providing necessary raid preventive equipments for passenger cars.
4. Completion of telegraphic and telephonic communication for emergency calls.
5. Establishment of network of intelligence system to forewarn bandit attacks.
6. Investigation of actual situation in the bandits infested zone.
7. Training of men under Nipponese instructors and acquisition of more arms.



Street scene in the town of Fuyu on the Sungari. Construction of the Hsinking-Peichengtzu Railway Line has brought a revival of trade and prosperity to Fuyu

8. Establishment of "Railway Protective Villages."

As a consequence of which even during the summer months of June, July and August when bandit menace is usually at its height only 30 cases of bandit attacks were reported, and the number of casualties was decreased to one-fifth of those during March, April and May.

Following table presents the statistics of bandit attacks on trains and railway properties for the years 1933 and 1934 which shows striking decrease in comparison with totals immediately following the "Incident." It reflects the efficiency of the railway guards and indicates the tremendous service they are rendering.

	Kilos.	No. of Cases	Percentage
Sept. 1932-Feb., 1933 (6 months)	3,160	1,724	54.6
March 1933-Feb., 1934 (12 months)	3,320	144	4.8
March 1934-March, 1935 (13 months)	4,757	162	3.4

NOTE:—According to the above table it seems as if there has been an increase of cases in 1934, but this is due to new lines that were built into remoter places having been added and moreover, the figures are given for 13 months, although the percentage is shown to be much less than in 1933.

Railway Protective Village

When the railways were still under the control of the Warlords, inhabitants living along the railways were indifferent towards the protection of the railways, even hampering, in some cases, the smooth operation of the railways in league with the bandits. This deplorable condition was brought about mainly by the misrule of War-lords which led the people to believe the railways to be an official instrument of "squeezing" the already emaciated people, a state of mind which is hardly to be blamed in view of the policies that had been followed.

The General Direction, recognizing this frame of mind, is doing its best to enlighten the downtrodden people to disbelieve such fallacies. It is trying to make them understand that railways are here to render public service and do not constitute a money "squeezing" institution. The railways are assisting them in their difficulties, and their effort is already bearing fruit.

One of the practical means by which the General Direction is succeeding in enlightening the inhabitants is the so-called "Railway Protective Village."

All those villages located within five kilometers on either side of the railway track and bus lines are included in this unique system. There are about 2,953 units of "Railway Protective Village," several small villages, about 100 households constituting a unit. This system embraces in total about 5,800,000 (large cities not included) inhabitants.

These villages are controlled through the Prefectural Governors in collaboration with the local Peace Maintenance Committee and railways. The master of the Village Administrative Section is

generally appointed Master of Protective Village, but wherever there is a railway Station, the Station Master is appointed the master. For practical purposes the railway maintains constant contact with the villages through the Station Masters who form the permanent agency for the railway in disseminating the spirit of devotion to the railway and on the other hand the Prefectural Governors and the Peace Maintenance Committee work through the village master to put the plans into effect.

The General Direction distributes pamphlets and sends out men to give lectures for implanting within the minds of the inhabitants the spirit of duty by convincing them that it is to their own advantage to care for and protect the railways and by showing them what are some of the things they could do to assist the railways, such as, to notify the railway guards when they get wind of the expected bandit attack, when they find rails taken away or rocks placed on track, etc. In other words, the co-operation with the railways in these matters is to be their duty. And the motto "Wangtao is from Tiehtao" or "Wangtao is from the railways" has been adopted to enhance this work. In return for these services the railway reciprocates to the members of the Protective Village by

1. Distributing high yielding improved bean seeds, paddy rice seeds, pigs, sheep, etc., under the conditions given in the chapter for "Local Enterprises."
2. Providing emergency medicine boxes at every station for the use of the villagers.
3. Running "Comfort Trains" and sending out travelling publicity corps to present motion pictures, phonograph, and to give free medical treatment.
4. Selling daily necessities at very low prices.
5. Providing recreation facilities, such as, conducting athletic meets, etc.
6. Organizing tourist parties to show them the country.
7. Giving preference to the so-called "Village of Merit" in the distribution of the above-mentioned seeds and animals and presenting "Medal of Merit" to individuals of good records, even, giving scholarship funds or employing them in the railway service.

Railway Protective Scouts

The General Direction, deeming it most effective to implant the feeling of devotion into the minds of the younger generation,



Street scene in Nungan which with its neighbor Fuyu is a Pioneer Settlement of North Manchuria

organized what is called the "Railway Protective Scouts" in November, 1934. The railway aims to train them to set a living example to the rest of the villagers as good citizens.

The Scout organization is composed of two groups, one is the Junior Group where boys of from 11 to 15 years of age are enrolled and the other the Senior Group composed of boys of from 16 to 20 years. They are chosen from boys of good records and behavior. And one scout is organized for every Protective Village in collaboration with the railway and the military authority; at present the number of scouts enrolled is altogether about 30,000. However, it must be understood that the Railway Protective Scouts are quite apart from the ordinary Manchoukuo Boy Scouts in that the former is closely affiliated with the railway.

Some of their duties are as follows:—

1. Distribution of various pamphlets, circulars, posters, etc., issued by the General Direction.
2. Assist the railway in taking the census of the protective villages.
3. Assist the railway in conducting various publicity and welfare activities, such as, travelling publicity corps to present entertainments to the villagers, in disseminating the news of arrival of "Comfort Train," in propagating the sense of devotion to the railway, especially, during the so-called "Railway Protective Week," act as guard and discipline officers when athletic meeting is conducted, etc.

As for the training of the Scouts, short sessions are held from time to time to cultivate what might be called the "esprit de corps" and trainings in the following subjects are given:—

I. Training

(a) Cultivating the "esprit de corps"

1. by conducting various mass games
2. military training
3. camping

(b) Training the tactics of ordinary Boy Scouts, such as, in the handling of Scout sticks, tying rope-knots, first aid, etc.

(c) Guarding

1. sentry
2. watch
3. scouting
4. making round of inspection

(d) Communication

1. mounted orderly
2. bicycle orderly
3. signal by light and sound



Street scene in Sian, a center of 30,000 population made prosperous by the output of the Sian colliery

II. Academic training

(a) Citizenship

1. common railway knowledge
2. observance of time
3. public morality
4. languages
5. arithmetic
6. meaning of the Imperial rescript
7. significance of the National Flag and National Anthem
8. sanitation
9. internal conditions of the State and foreign affairs
10. spirit of "Wangtao" (Kingly Way)
11. thrift
12. tour through the country

(b) Science

1. study of native plants, soil and minerals
2. natural phenomena, such as, the cause of wind, rain, snow, etc.
3. knowledge of Western Calendar
4. astronomy

(c) Social service

1. railway protection
2. improvement and repairing of roads
3. afforestation and reforestation
4. fighting fire
5. life saving from drowning

Besides the trainings mentioned above, vocational training, such as, rearing of honey-bees, growing of fodder grass, marketing such local products as pheasants, edible turtle, eels, etc., instructing sanitary method of making broiled fowl to be peddled at stations, making colored manual art materials from kao-liang stalks (similar to bamboo) to be used by school children in making pen holders, toys, etc.

Moreover, in order to encourage the Scouts the railway

1. gives rewards to Scouts of good records,
2. employs some of them with good records in the railway service through examination,
3. sends them on sightseeing trips to principal cities, expenses being defrayed by the railway.

Although it has not been very long since the establishment of these systems, number of reports regarding bandit operation incoming from the Protective Villages amounts to from 5,000 to 6,000 per month and the number of cases of rewards given totals 200 with aggregate of more than 1,000 persons.

Comfort Train

The so-called "Comfort Trains" are operated by the General Direction several times a year to comfort and entertain the employees and people living along the lines that are remote from centers of civilization. The train is composed of troupes, such as, performance troupe, cinema troupe, medical troupe and sales troupe.

The train gives free entertainment in the form of cinema, phonograph and simple dramatic performances. The train also treats the sick free of charge and sells daily necessities at nominal

prices. The General Direction also operates Comfort Ship and Bus of similar organization.

The table below shows the results of work done by them:—

		Number of patients treated free	Amount of neces- saries sold
Comfort Train	1933	7,666	MY. 78,077.28
	1934	8,939	69,026.68
	1935	28,381	164,194.04
Comfort Bus	1934	3,007	7,282.31
	1935	4,071	12,028.16
Comfort Ship	1934	1,337	25,253.25
	1935	1,824	36,394.16

Another means of comforting the employees in remote spots is the circulating library. This system is to circulate boxes with 30 books in the larger and 20 books in the smaller. A box is to be kept in a place for one month and then sent to an adjacent place: thus, they circulate. Books are Japanese and Chinese books.

Local Enterprises—Land

As the land management is one of the most important factors in the development of localities along the railway, the General Direction undertook to rent the land under its control to *bona fide* individuals for business as well as for residential purposes, excepting those sites that are retained for railway's own use, at impartial and reasonable rentals. This replaced the old practice before the "Incident" when foreigners were strictly prevented from acquiring

leasehold on land. In other words the "principle of the open door" is strictly adhered to and the railway's policy is to give as much convenience to the general public as possible.

The total area of land under the management of the railway transferred to the General Direction by the Manchoukuo Government is approximately 311,575,146 square meters. This figure does not include the land attached to the recently constructed railways and former C.E.R., so in reality the present area is much larger, new figures not available at this writing.

Town Planning

Generally speaking, before the "Incident"

the population along the State Railways, was insignificant especially, in the remote districts where until recently, only very few people ever had trodden, consequently the founding of communities was not frequent. However, after the successes attending the assiduous bandit suppression campaigns on the part of Nippon and Manchoukuo troops, together with the efficient operation of the railways and building of new lines and highways, peace and order have been restored as have never before been experienced. And now the localities along the railways have come to flourish and towns are springing up at various places throughout the country. Consequently, the General Direction is expending its utmost in town planning, and the construction of roads, water system, parks, bridges, levee, etc., are now going in full force.

Enhancement of Industries

In due consideration of the impoverished industries and the primitive method of farming practiced by the native population,



A glimpse of Kaolishan on the Mukden-Antung Railway

the General Direction is making a thorough investigation of the economic and industrial possibilities and potentialities of the railway hinterland, in its endeavor to discover the industry or product most suited to a particular locality. That done, it is to extend its helping hands in the introduction of new industries, exploitation of newly found resources, enhancement of already existing industries, if sound, development of trade by supplying references and practical and technical advice, and by answering questionnaires.

Manchoukuo being primarily an agricultural country, efforts are concentrated upon this industry more than in any other.

Establishment of Various Agricultural Institutions

The following institutions that have been or will be established, will soon revolutionize the hitherto haphazard way of conducting farms and will eventually help to raise the standard of living which in turn means many other improvements, such as, higher standard of knowledge, culture, education, etc. :—

1. Agricultural experimental stations to develop and improve seeds for distribution to farmers, on conditions mentioned later, to test the suitability of soil, to discover whether or not hitherto untried crops could be raised at good advantage, to study new methods of cultivation suited to the land, etc.
2. Nurseries to raise plants for afforestation and reforestation.
3. Farm for animal husbandry to breed superior stock to be lent or sold to the farmers to improve their animals.
4. Weather bureau to give necessary weather information to the farmers daily.

These institutions are located in the following places :—

1. Agricultural and forestry experimental stations.
 1. Tumenling (Hsinking-Tumen line) for forestry
 2. Harbin
 3. Hsingcheng (Mukden-Shanhaikwan line)
 4. Shanchengchen (Mukden-Kirin line)
 5. Kokenmiao (Paichengtzu-Halunarshan line)
2. Nurseries.

1. Mukden-Shanhaikwan line—7 places
2. Ssupingkai-Tsitsihar line—5 places
3. Harbin-Peian line—2 places
4. Hsinking-Tumen line—2 places
5. Hsinking-Kirin line—2 places
6. Hsinking-Harbin line—1 place
7. Chihhsien-Chengte line—1 place
8. Tahushan-Tungliao line—1 place

Afforestation and reforestation.

1. Hsinking-Tumen line—5 places
2. Between Taonan and Angangchi—1 place

3. Animal husbandry farms.

1. For pigs
 - at Shanchengchen (on the Mukden-Kirin line)
 - at Suihua (Harbin-Peian line)
 - at Paichengtzu (Ssupingkai-Tsitsihar line)
 - at Kirin (Hsinking-Tumen line)
 - at Nuerho (Mukden-Shanhaikwan line)
2. For sheep
 - at Paichengtzu
 - at Paichia (Harbin-Peian line)
 - at Yangchuentzu (Mukden-Shanhaikwan line)

4. Weather bureau.

- at Wuchang (Lafa-Harbin line)
- at Suihua

Enhancement of Livestock Industry

In order to encourage the livestock industry efforts are expended by the railway to instruct the native farmers how to improve the native strain, so that they will be able to produce better and more wool or meat per head. And the natives being without hygienic knowledge, the railway is taking steps to prevent and stamp out cattle disease, such as pig-cholera, anthrax, etc., by inoculation and other means.

Some of the means employed by the railways to encourage the livestock industry are :

1. lending and selling of young animals of improved and imported breed, such as, Berkshire pig and Merino sheep.
2. giving scientific advice and instruction as to how they should be reared.
3. giving market information.
4. holding exhibitions of breeds to judge whether they were properly bred and give prizes to the best bred animals.
5. showing moving pictures to instruct how livestock farm should be conducted.

These are done through those institutions mentioned in the preceding chapter.



Lumbering in Kirin

Conditions for Sale of the Young Animals

Although at the outset the railway gave away animals free of charge, the natives do not value them as when they pay for them. Some time it even happens that animals given free are killed for their meat or skin. Consequently, they are now sold or lent to the farmers under the following conditions.

- (a) Sheep are sold at current market price when they are one year old.
- (b) Pigs when they are six months old, also at current market price.

Inasmuch as the animals are sold for the expressed purpose of improving the native strains, it is on the understanding that they shall not be sold or killed for meat or hide nor shall the holders refuse to have

the beast injected against epidemic disease when deemed necessary, although the railway has no right to compel them.

Conditions for Lending Young Animals

As for the number of animals to be lent, only one male shall be lent at one time in the case of pig, but in the case of sheep, although ordinarily only one male is lent at a time as in the former case, upon special applications females are also lent. If expressed in diagram form it will be as follows :—

- (a) Sheep—Male—1
or Male—1
with
30 to 50 females of native strain
- (b) Male pig—1

They are lent upon three year contract, renewable after expiration, in both cases.

In case male sheep alone was lent, one of the newly bred lambs is to be delivered to the farm every year, if a male sheep is lent with native female sheep and if these sheep die while on loan they shall be replenished by an equal number of newly bred sheep when they become one year old and returned every year to the farm together with 10 per cent of the number of female sheep lent.

As for the pigs they are lent to farmers at 20 sen per each female pig served.

General Survey of what has been and will be done

In order to improve the native strains, it is quite necessary that considerable number of superior breed be imported. The following table shows number of sheep, pigs and cattle imported and lent to farmers since March, 1933.

Sheep	Merino female	..	..	..	36
		male	..	..	260
	Improved (near Merino)	female	..	..	58
		male	..	..	173
	Good native stock	female	..	..	9,818
		Total	..	..	10,345
Pig Berkshire	female	..	..	..	60
	male	..	..	..	1,325
	Cattle cows	..	..	..	1,385
		..	..	..	160

While assisting farmers to improve the breed of animals, the General Direction is assisting the farmers to solve the question of fodders. For this purpose production of alfalfa is encouraged and in 1935 about 5,000 kgs. of seeds were distributed while we expect the demand from farmers to exceed 10,000 kgs. in 1936.

Besides sheep and pigs, there is a plan to increase the number of oxen as beast of burden to be employed in paddy rice field and other farms.

The General Direction plans to establish a far-reaching 10-year plan to develop the live-stock industry along the railways and is now making thorough study of the actual situation and how the plan should be carried out to the best advantage of the country as a whole.

Few of the plans for the fiscal year 1936 are as follows :—

1. It is planned to purchase the following superior breeds :—

	Female	Male	Total
Sheep	10,000	300	10,300
Pigs	50	800	850

2. To encourage farmers to breed animals for production of fur and hides.
3. To encourage poultry farms in order to meet the shortage of egg supply.
4. To encourage bee-culture.
5. To encourage raising of more milk cows.

Enhancement of other Agricultural Enterprises

Some of the principal features of the methods employed to encourage agriculture are as follows :

1. Distribution of better seeds.
2. Examination of soya bean growing and giving prizes to successful growers.



Pig farm at Shanchengchen



One of the railway schools of the Manchoukuo State Railways

3. Instruct method to improve native seeds.
4. Holding exhibition of agricultural produce.
5. Inspection of actual agricultural conditions in the districts along the State Railway, Bus. and River lines and publication of the reports.
6. Giving annual grant of Y.10,000 to the Manchuria Raw Cotton Association in order to assist the association in the distribution of improved cotton seeds to replace the low yielding native seeds.
7. Improvement of paddy rice plant.
8. Investigation of crop conditions of various seeds distributed to the Protective Villages.
9. Investigation of the financial conditions of farmers to assist them in case of necessity and establishment of the so-called "Model Villages" to lead other villages in the improvement of farm.
10. Instruction of able youth in scientific agriculture (See chapter for "Education.")

Conditions for Distribution of Improved Bean Seeds

Improved bean seed are generally distributed by immediate exchange method, that is, they are exchanged for the same amount of what the farmers have in stock of the original unimproved seeds immediately upon delivery of the seeds. In some districts, however, for instance along the Mukden-Kirin line where cultivation of beans is still in an undeveloped stage, the railway distributes the seeds, but waits until the harvest in autumn to have the seeds returned to them out of the new crop.

The Protective Village Masters act as overseers to report on the progress of cultivation three times during a season. They see that the farmers sow the seeds harvested from the distributed seeds the following year. The Masters also distribute the seeds when there is a request for the improved beans from the villages adjacent to the Protective Village districts. Thus, the Masters are able to come into personal contact with the people, which affords them opportunities to spread the spirit of co-operation with the railways.

TABLE SHOWING THE AMOUNT OF SEEDS DISTRIBUTED IN 1933, 1934 AND 1935

Fiscal year	Paddy rice	Improved bean seeds	Sorted bean seeds	Sorted wheat
1933	45,000	327,000	300,000	—
1934	59,150	299,200	342,000	157,000
1935	90,000	295,000	625,000	195,000
Total	194,150	921,200	1,267,000	352,000

NOTE.—Sorted seeds refer to the better seeds sorted out from the selected native seeds, usually about 65 per cent being sorted out.

For the current year efforts will be concentrated upon the following points:—

1. Extermination of noxious insects and disease.
2. Establishment of agricultural associations, such as, Tobacco Growing Association, Fruit Growing Association, etc., in order to develop the spirit of self-determination among the farmers, to facilitate marketing, etc.
3. Encouragement of secondary occupation for children and women folks and for idle season when farming is not possible, such as, during frozen winter.
4. Purchasing of tractors for opening up virgin land and to be lent to farmers who require them.
5. Instruction of farmers in disinfecting seeds, particularly, millet and kaoliang.

Forestry

Forestry is also an important enterprise of the General Direction. For this purpose experimental stations for forestry and nurseries are established at various places to raise necessary plants for afforestation, reforestation, beautifying station compound and railway zones, planting in the parks and in pleasure resorts, and raising timbers necessary for railways' use.

Although there are already 17 nurseries, it is expected that 29 more will be established in the next ten years. During the year 1935 about 660,000 plants were distributed free for afforestation and reforestation at various places along the railways, and in 1936 about three millions are to be distributed. For the purpose of protecting railways from floods and sand and snow storms, it is planned to plant forests along the railways.

Education

The schools that existed before the establishment of the General Direction were opened for elementary education of employees' children. All of them were primary schools, save one, a preliminary middle school at Kirin controlled formerly by the Kirin-Changchun line.

With the taking over of these schools by the General Direction, it immediately set to work to investigate the real conditions obtaining in the schools. At a conference of school principals the policy of the General Direction was indicated to them, that is, to base the policy upon the principle of "Wangtao," which is identical with the spirit attending the establishment of Manchoukuo, and to give fundamental education to create good citizenship with emphasis on the following points:—

1. to cultivate national morality and international accord.
2. to attach importance upon practical education and knowledge.
3. to give sound physical education.

Moreover, in order to insure accomplishment of this policy the standard of the teachers had to be elevated. For this purpose the General Direction has inaugurated a system of short training session from time to time to give practical instructions in teaching. Teachers are also sent abroad for further study.

Next in importance is the quality of the text book. The General Direction, therefore, undertook to abolish those text books employed before the "Incident" that were based upon anti-foreign thoughts. And in their place, the schools are now employing text books issued by the Publishing Department of the Manchuria Educational Association. Furthermore, a wholesale change was made in the hours of assignment for respective subjects. The salient points of this revision was to abolish the system of unchangeable stable hours of assignment and to employ in its stead a system whereby hours would increase with the advancing grade, that is, 23 hours to 32 hours per week.

Third step was to make the teachers' position secure. During the former regime, schools were conducted more or less on the basis of contract between the railway and principal, that is, a principal had absolute power in all internal matters of a school. He had the power to employ or to discharge any teacher practically at will, without due regard to his ability. There was a practice where a principal sent out "call" letters before the beginning of a semester



Nursery at Tumenling

and those who did not receive this letter were not required to return. One year was divided into two semesters with vacations in between. When the first semester closed at the end of July until September for the summer vacation, the principal sent out "call" letters to the teachers before the beginning of new semester. This happened twice a year at the beginning of each semester.

In order to ameliorate this condition, the sole power to discharge or to employ teachers was vested in the hands of the General Direction which will enable the teachers to serve not only with peace of mind, but they will also have an impetus to serve with sincere purpose for when their ability is recognized they will receive due promotion in salary as well as in position, whereas, heretofore, there was no real pleasure involved in teaching. It was merely mechanical and perfunctory, because only the favor of the principal meant advancement and security.

Primary schools for education of employees' children operated by the General Direction:—

Location	Classes	Pupils		Total	Teachers	
		Boys	Girls		Manchus	Japanese
Hwangkutun (Near Mukden)	16	546	216	762	18	3
Kowpangtzu	6	189	75	264	8	1
Hopei	5	174	63	237	6	1
Chinhhsien	8	238	94	332	9	2
Shenyang	15	457	219	676	17	3
Ssuping kai	14	422	168	690	16	3
Chengchiatun	6	215	71	286	7	2
Taipingchuan	4	112	31	143	6	—
Taonan	12	390	121	511	14	2
Taonan (Branch School)	2	42	9	51	2	—
Tsitsihar (Taonan Branch)	6	181	110	291	7	1
Hsinking	13	412	158	570	14	3
Kirin (Hsinking Branch)	6	139	79	218	7	1
Harbin	3	59	26	85	4	—
Total	116	3,576	1,440	5,016	135	22

NOTE:—When there are rooms outsiders also may be accommodated.

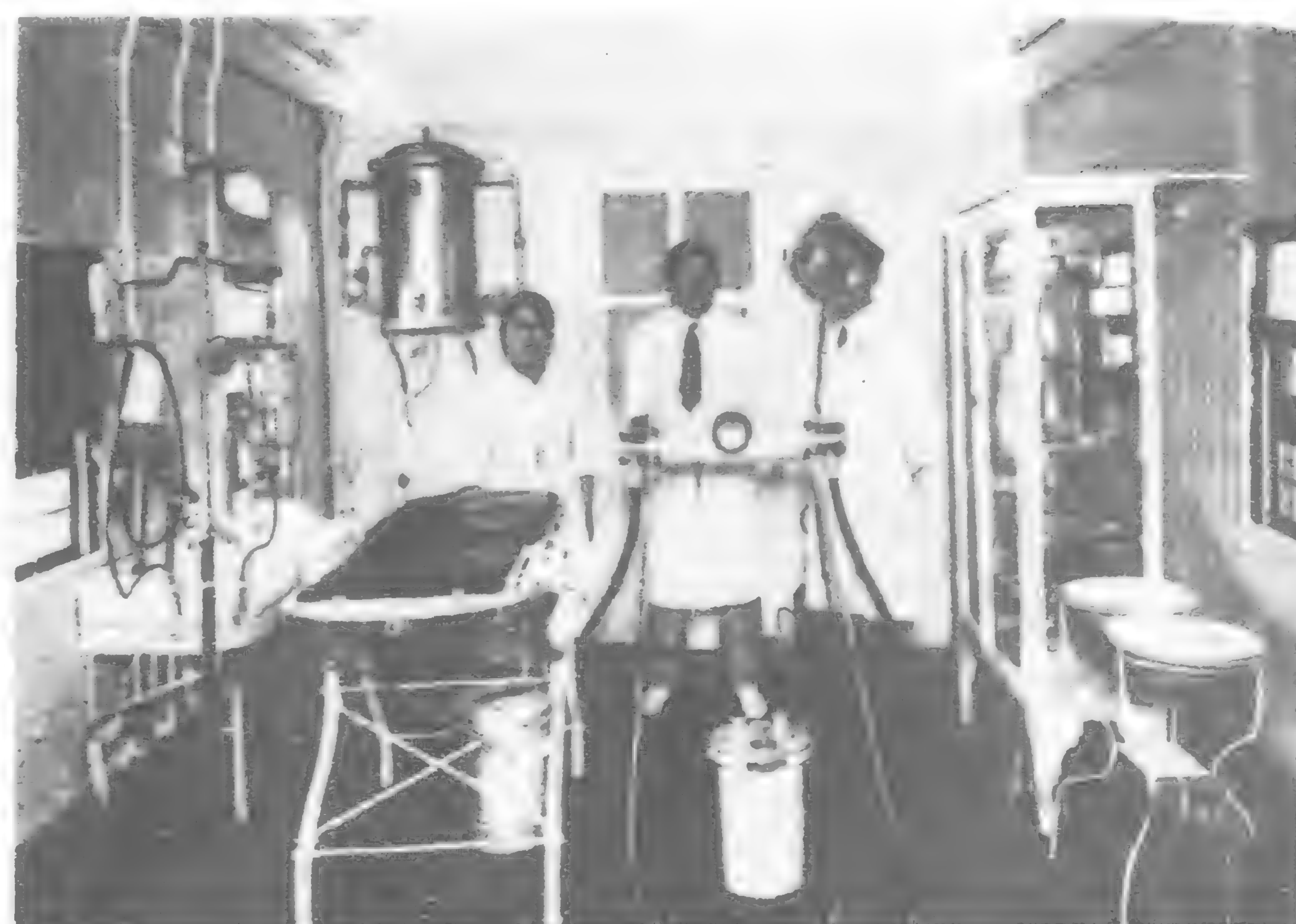
Those primary schools which were transferred with the Chinese Eastern Railway were indefinitely closed on May 1, 1935, pending the decision as to what shall be the new policy.

Railway Training Institute

Due to lack of proper education and training, the railway employees have been unable to give full satisfaction in their service to the railways. In view of this fact the General Direction established in Mukden the Railway Training Institute in March, 1934, for the



Pharmacy in the Hsinking railway hospital



Interior view of hospital train of the Manchoukuo State Railways

benefit of Manchoukuo youths, and is now accommodating an aggregate of 1,150 pupils in various classes.

The school is divided into regular courses (one year preparatory and three year regular courses), and special short sessions of from two to three months duration.

The subjects taught are in general as follows :—

Regular Course	I Traffic	Station duties—Goods and passenger
		Train service....Train master, operating conductor, etc.
	II Mechanical	Locomotive, passenger, and Engineering (goods cars.
Short Session	III Civil engineering....	Track maintenance, etc.
	I Telegraph Operation (1 year)	
	II Railway Guards (3 months)	
Apprentice	Mostly workshop apprentice to train skilled labor (3 years)	

Outsiders with preliminary middle school education or of equal education and employees already in the service are admitted after an examination. The outsiders will be ultimately employed by the railways after successful completion of the course.

From an outsider admitted into the regular course seven yuan a month is collected, nominally to cover stationery, meals and lodging, while the railway provides them with uniforms. In case of outsiders who cannot afford to take the regular course they are encouraged to take the short session in which case 12 yuan for married and eight yuan per month for unmarried men are paid as encouragement. Although employees could take the regular course, very few take it because while in the school they will only be paid 12 yuan a month without the regular monthly pay. Consequently, they resort to the short session where they are paid an amount sufficient to cover the extra expenses from it besides their regular pay.

To the Railway Training Institute, moreover, a dormitory which accommodates 1,150 pupils is attached. A dormitory which accommodates 537 pupils is also attached to the branch school at Mihanazono near Mukden. Moreover, dormitories for schools in Mukden, Kirin, Tsitsihar and Harbin, each being able to accommodate 30 to 50 pupils have been established in 1935.

The training school formerly operated by the North Manchuria Railway has been transferred to the General Direction and is now being managed on similar lines as the one in Mukden.

Instruction in Scientific Agriculture

In order to implant scientific agricultural knowledge, the railway last year selected 40 students, whose ages are about 15 to 20 years, out of 167 candidates who are graduates of elementary schools and had been engaged in farming for more than two years. They were recommended by the respective Prefectural Governors picked from among the sons of village masters and comparatively well-to-do farmers. They were sent to Kungchuling Agricultural Experimental Station of the S.M.R. to be trained for three years in various phases of agriculture. Upon finishing the three year course, they are to return to their farms and become leaders of agricultural industry. For a period of three years after the completion of the

three year course they are asked to make a report once every month as to what they have accomplished to the Kungchuling Training School mentioned above who will in turn report to the railway authority concerned. Not only are they trained without charge, but the railway also assumes expenses for board and meals, the students defraying only the stationery expenses.

Sanitation Hospitals

Before the operation of the railways was entrusted to the General Direction, the hospitals for employees were operated separately by the respective railways and were generally ill-equipped and poorly managed. Therefore, the General Direction undertook to unify all hospitals under one control, and improvements were effected by introducing new equipment and modern methods.

Owing to the tremendous expenditure necessary should hospitals be established throughout the entire railway system, the railway has built a hospital-train in order to cover remote places for the benefit of its employees as well as of the general public. The train commenced operation from July 1, 1935. The cars for this train were remodelled from the ordinary passenger cars. The train is composed of three cars, first for internal treatment, second for surgical treatment, and third for kitchen, dining room, bath and quarters for doctors and clerks. The first car is composed of consulting room, pharmaceutical room, and clerical office, the second is divided into consulting room, operating room, and ward with six beds.

Location of Railway Hospitals and Dispensaries Managed by the General Direction

Hospitals :—

Mukden, Hsinking, Harbin and Tsitsihar.

Branch Hospitals :—

Chinhshien, Yepaishou, Shanchengchen, Wuchang, Tunhua, Hailun, Peian, Hengtaohotzu, Suifenhö, Ssupingka, Chengchiatun, Taonan, Buhetu, Hailar and Manchouli.

Dispensaries :—

Tahushan, Kowpangtzu, Hsingcheng, Changwu, Chingyuan, Hopei, Chaoyangchen, Chaoyanchuan, Sungpu, Suihua, Yao-men, Shuangchengpao, Harbintaoli, Anta, Ashihho, Ihmienpo, Muleng, Taipingchuan, Chiangchiao, Ningnien, Koshan, Chienkuochi, Angangchi, Hsinchan, Mukden Central Station, Shenyang (Mukden), Harbin Shipyard and Yentungshan.

Special Institutions :—

Fulaerhchi Sanitarium.

Harbin Bacteriological Laboratory

In the 47 hospitals, branch hospitals and dispensaries mentioned above there are altogether 92 doctors and 330 nurses and the number of patients treated during the period from March to September, 1935, was as follows :—

Out-patients	168,498
In-patients	40,122
Total	208,620

(Continued on page 506)

The Canton-Hankow Railway and the Development of China

By Professor C. A. MIDDLETON SMITH, M.Sc., M.I.Mech.E., Dean of the Faculty of Engineering, University of Hongkong in "The Engineer"

DURING a recent visit to England my chief interest was to search the pages of the daily and weekly press for items of interest about the Far East. There were numerous references to bandits, political crises, and interesting "write ups" about the Chinese art treasures exhibited in London: but there was no mention of the important engineering work that is being carried out in many parts of China. Yet the work of the engineer will affect the future of that vast territory more than any of the "news items" concerning the country "featured" in the columns of the Press in Great Britain. Engineering construction in China is not sensational, but it is extremely interesting. It will in a few years cause a great transformation in the daily lives and outlook of the most numerous race on earth.

The progress that has been made by Chinese engineers during the last ten years is of far more importance to the Chinese and to the rest of the world than all of the petty ambitions and the fighting of War-lords, the intrigues of politicians, and similar matters that are brought to the notice of the public in England. For engineering work is now appreciated by nearly all the new generation of educated Chinese, who encourage its development as a cure for the poverty and the political difficulties in their own country.

In such a huge territory rapid communication is of the utmost importance for any unified system of Government. Railway construction is repeatedly urged by Chinese leaders of public opinion for both political and economic reasons. The work is difficult and financial problems are not easy to solve. It is, however, encouraging to record recent progress.

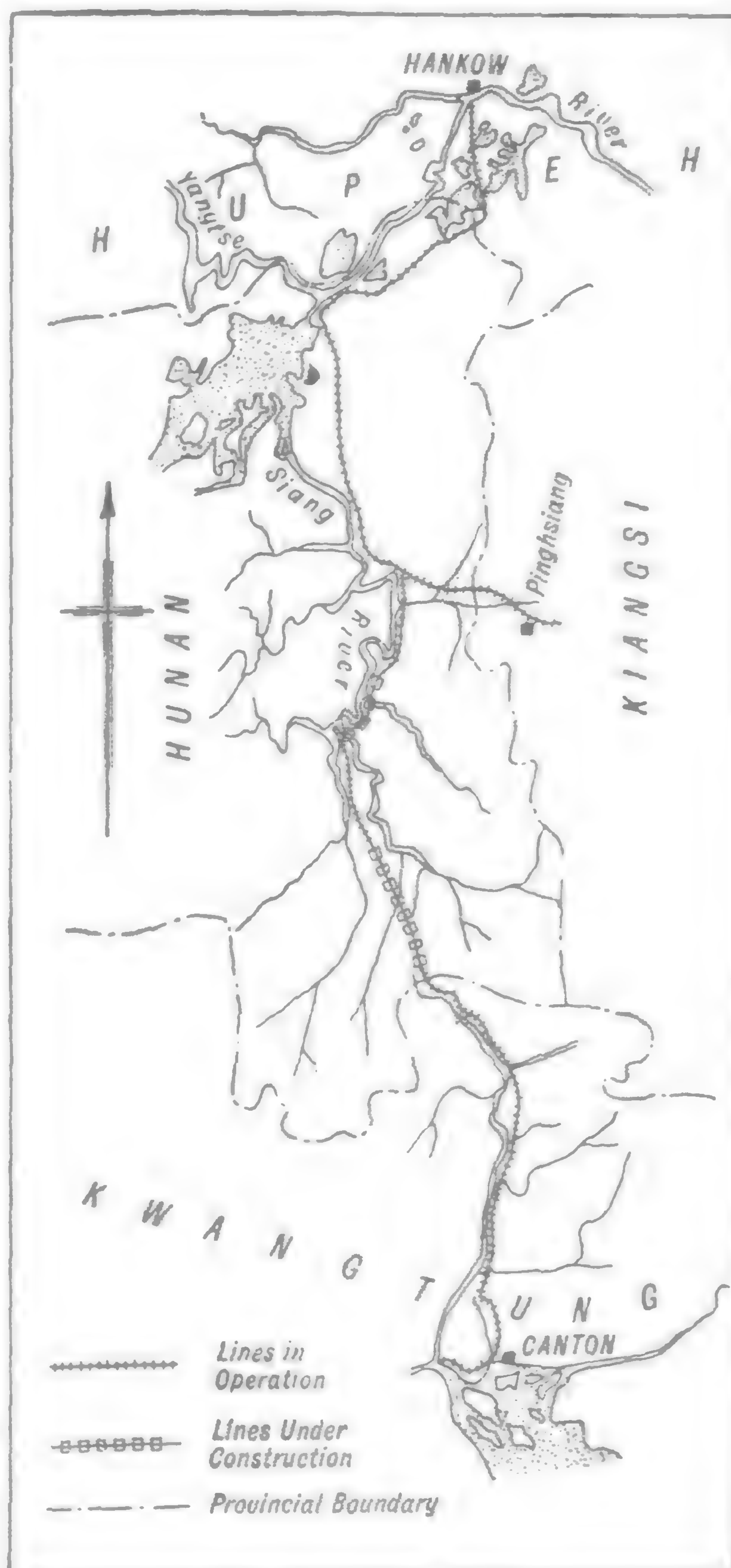
Bribery Delays Construction

The history of China's railways reveals a curious medley of motives that created all

sorts of obstacles for the engineer impatient to get on with the practical work of construction. The main interest of the Manchu Court mandarins in the days of "concessions" was "squeeze." They genuinely believed that it was a legitimate method of obtaining remuneration for an official position that carried an entirely inadequate salary. They believed that it was not immoral to accept "squeeze," for it was merely what our salesmen regard as a "commission." It was payment due to them: and it was essential to overcome obstruction. Old customs die hard in China: "squeeze" still exists in some official circles, in spite of the splendid efforts of many high-minded Chinese of the new generation to eliminate it.

The European concession hunters of the nineteenth century, too, were not really interested in the economic development of China—they also wanted only to make a "commission" out of their intrigues. The foreign legation officials in Peking no doubt were free from suspicion of "squeeze," but they worked hard to checkmate any other nationals, so as to win a diplomatic victory for their own legation. They were prodded into activity, not only by concession hunters, but by financiers and representatives of manufacturers of railway materials. And so the battle of wits went on in Peking: as a result, there was delay in construction and but little work for the engineer, who was often treated none too generously.

The unbiased onlooker saw the tragedy impending. The eighteen provinces of China proper (each of them, on the average, the size of Great Britain) could only be united to a central Government by rapid communications. The centrifugal effect of the new Western political theories, beloved by "returned students," especially those from the United States of America, could only be neutralized by the centripetal force of rapid communications, including many railways.



Situation of the Canton-Hankow Railway



Reinforced concrete arch bridge on the Canton-Hankow Railway



One of the tunnel portals on the Canton-Hankow Railway

Alas! the engineers were unable to get on with their work because of the intrigues in Peking.

Then came the 1911 revolution, producing more centrifugal forces. To-day, the writ of the Central Government (now in Nanking) runs only in five out of the eighteen provinces. In the other parts of China there are independent Provincial Governments. The dependencies of Manchuria, Tibet, Mongolia, and even areas in northern China, have now no allegiance to Nanking. The decentralization of government in China has been a tragedy that could have been averted by railway and other engineering construction work.

Fortunately, that fact is realized by a large number of scientifically trained Chinese. The struggle now is between the official intent only on "squeeze," and the active Chinese engineers and their associates who demand railways, roads, and economic development. In the end, the victory of the latter is inevitable. It is surely the duty of every honest man to encourage those whose constructive efforts will finally reduce the terrible poverty in the country. Railways, roads, and flood prevention works can do that. The engineer in China now is at long last making progress. Many of the Provincial Governments, as well as the Central Government in Nanking, are very active in connection with various types of engineering work.

An Important Railway

It can be said that the most important of China's trunk railway lines is now practically completed. It is the line connecting two great cities, the chief center of economic life in South and Central China, viz., Canton and Hankow.

The history of the Canton-Hankow Railway has been one long chapter of postponement caused by financial and political struggles. The construction of a trunk line connecting Hankow (or, to be more accurate, Wuchang, immediately opposite Hankow, the latter city being on the north bank of the Yangtze) with Canton was first advocated by Sir MacDonald Stephenson some seventy years ago. In every scheme for a comprehensive system of railways in China, it has occupied a prominent position.

The Engineer Delayed

The first effort to build the line connecting Canton and Hankow was made by an American company, which obtained a concession in 1898. A survey caused the promoters to realize that the original estimate of £4,000,000, or rather more than £5,000 per mile, was wrong. They came to the conclusion that it would cost twice as much. The estimate, to-day, for the total cost of the 681 miles of the line is \$175,000,000 China currency, which, at the present rate of exchange, is rather more than £11.5 millions sterling.

Soon after the original concession was granted there commenced the "frontal political" and "flanking financial" movements, by officials of practically all the legations in Peking, and many financiers, to finance the work and so to secure the concession to build the railway. The Governments of Great Britain, France, Germany, and the United States, the Hongkong Government, and many individuals including Mr. J. Pierpont Morgan, took a hand

in the game. The history of the struggles is too involved for description now and, indeed, may well be forgotten.

The position in 1929 was, briefly, that a considerable amount of work had been done in building the line. From the Canton end, in 1915, about 138 miles north to Shaochow had been completed. From the Hankow end 228 miles of line had been finished in 1917, from the northern terminus to Changsha. This section was finally joined up with a short stretch from Pinghsiang to Chuchow, finished in 1905: coal was then conveyed from Pinghsiang mines to Changsha, finding its way by water to Yangtze ports.

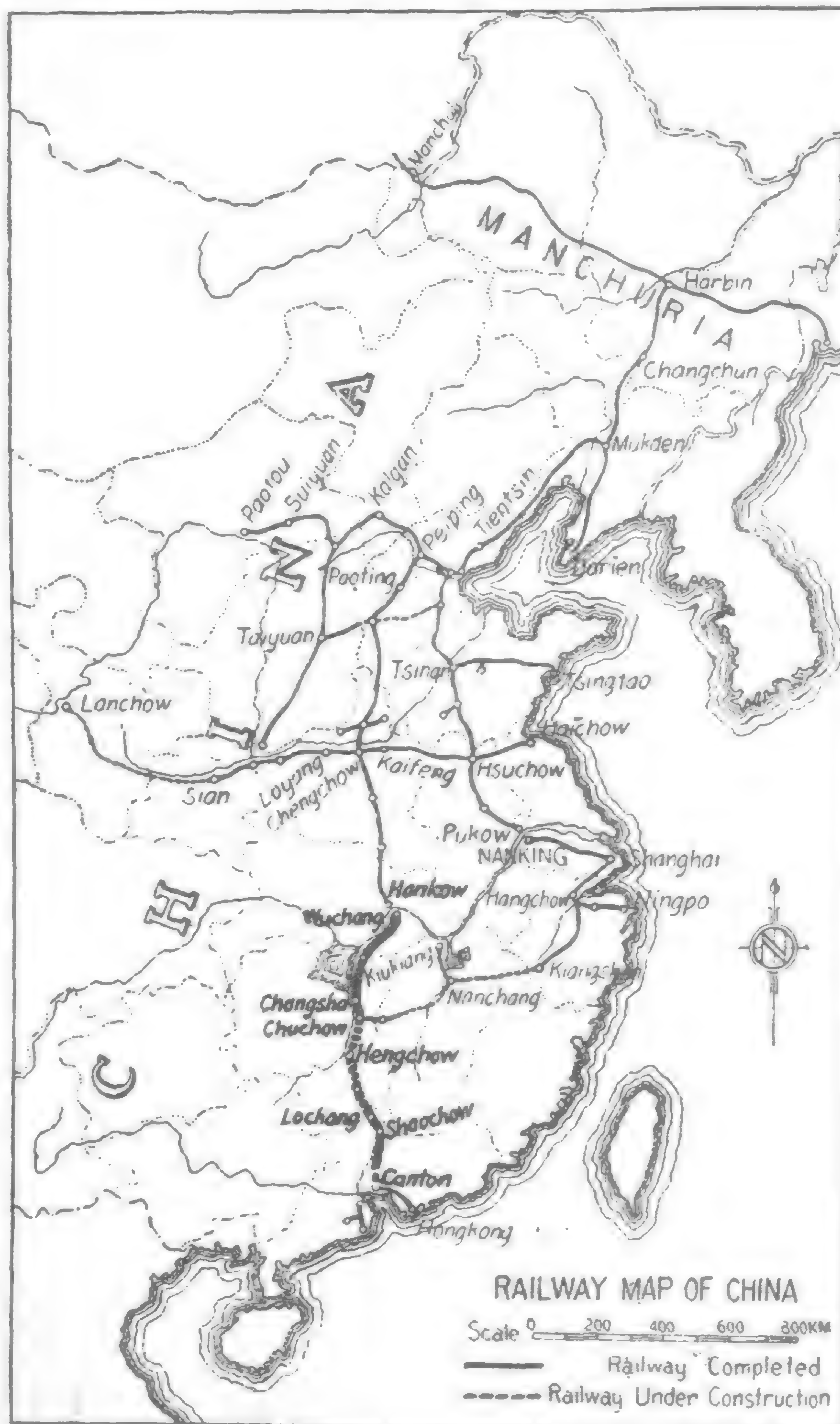
The most important trunk line in China, other than the Canton-Hankow Railway running, more or less, from north to south, is that joining Peiping to Hankow and 755 miles in length. The southern terminus of this line is separated from the northern terminus of the Canton-Hankow Railway by the wide Yangtze River. At its narrowest point near Hankow the river is 4,250-ft. wide. A train ferry will connect the two trunk railways. The total rail journey from Canton to Peiping is therefore 1,436 miles.

It will thus soon be practicable to travel by train from Canton to Peiping. The line runs almost due north. For many centuries couriers had maintained communication between Peking and Canton. The route was very much to the east of the railway lines now connecting these cities. By courier the distance was 1,933 miles. North of the Yangtze horses were used: south of China's giant river horses were useless because of the waterways and mountains: the route in the southern province of Fukien and Kwangtung was covered on a narrow paved track. Ordinary letters were delivered in fifty-six days, but the time limit for Imperial dispatches was thirty-two days, and very urgent official messages were speeded up to eleven days. Before the revolution (1911), which established a republic in China, tribute of rice was sent each year from Canton to Peking—the pre-revolution name of Peiping. The journey was then made by rivers and the Grand Canal, except for a short distance over the mountain range that separates the rivers that flow past Canton (the rivers in the provinces of Kwangtung adjoining Hongkong) from the Yangtze river system. Over that divide, which has presented great difficulties to the railway engineers, there was a paved mountain track,

some 29 miles long, and rice was in the old days carried over it on the backs of numerous coolies. The journey from Canton to Peiping for goods in those days took about six months. By rail the journey will take some three or four days. By the air services which now connects Canton and Shanghai and also Shanghai and Peiping the time is shortened to two "hops" of about eight hours each "hop."

Efficient Chinese Engineers

It has been the policy of the British Government, during the last decade, to encourage engineering development in China. A condition of the return of the Boxer indemnity funds to China was that a large proportion of the money should be spent on railway



The map of the Canton-Hankow Railway



Mi-Ho bridge on the Canton-Hankow Railway



Road bed on a side cut showing general topography of the region

construction, and other engineering works, and education. Great efforts have been made by the British in Hongkong and elsewhere to train Chinese in applied science.

As a result one of the most important construction works in China is now nearly finished. It is the 251 miles of railway track that was necessary for the completion of the Canton-Hankow Railway. It is work that has been carried out under most unusual difficulties, owing to local conditions, for that section of the line passes through very mountainous country.

It may surprise readers of this journal to read that the whole of the construction work on this 251 miles length from Lochang to Chuchow has been carried out by an all-Chinese staff.

Captain R. D. Walker, M.I.N.S.T.C.E., manager of the British section of the Kowloon-Canton Railway, recently inspected this section, at the invitation of the Chinese authorities. He paid a tribute, in public, to the efficiency of his Chinese professional friends on his return to Hongkong. He said: "The whole of the construction work has been performed by an all-Chinese staff and they are particularly proud of this. I must say that they have every reason to be pleased, as the work is particularly well organized and executed." The writer, from his own experience, can add that there are now many well-trained Chinese engineers doing excellent work in China. There is, of course, great scope for their energies and scientific knowledge in their own country.

The railway connecting these two important cities of China, Hankow and Canton, each with a population of more than a million, must have great economic, as well as political, results. The line joining them totals 681 miles in length. It passes through rich

provinces with an aggregate population exceeding 90,000,000. Through traffic between the termini will be inaugurated in October next.

Financing the Work

In July, 1933, the Trustees of the British Boxer Indemnity Funds granted a loan to the Chinese Ministry of Railways of £1,660,000 for purchasing foreign materials and about \$32,000,000 (silver currency) for work and native materials. The violent fluctuations in the post-war era of the relative values of silver and sterling make it difficult to give sterling values. Thus in 1920 a silver dollar in Hongkong was worth 6s. 3d., but to-day it is fixed at about 1s. 3d. (a pegged currency), and it may remain at that level, as China is now off the silver standard.

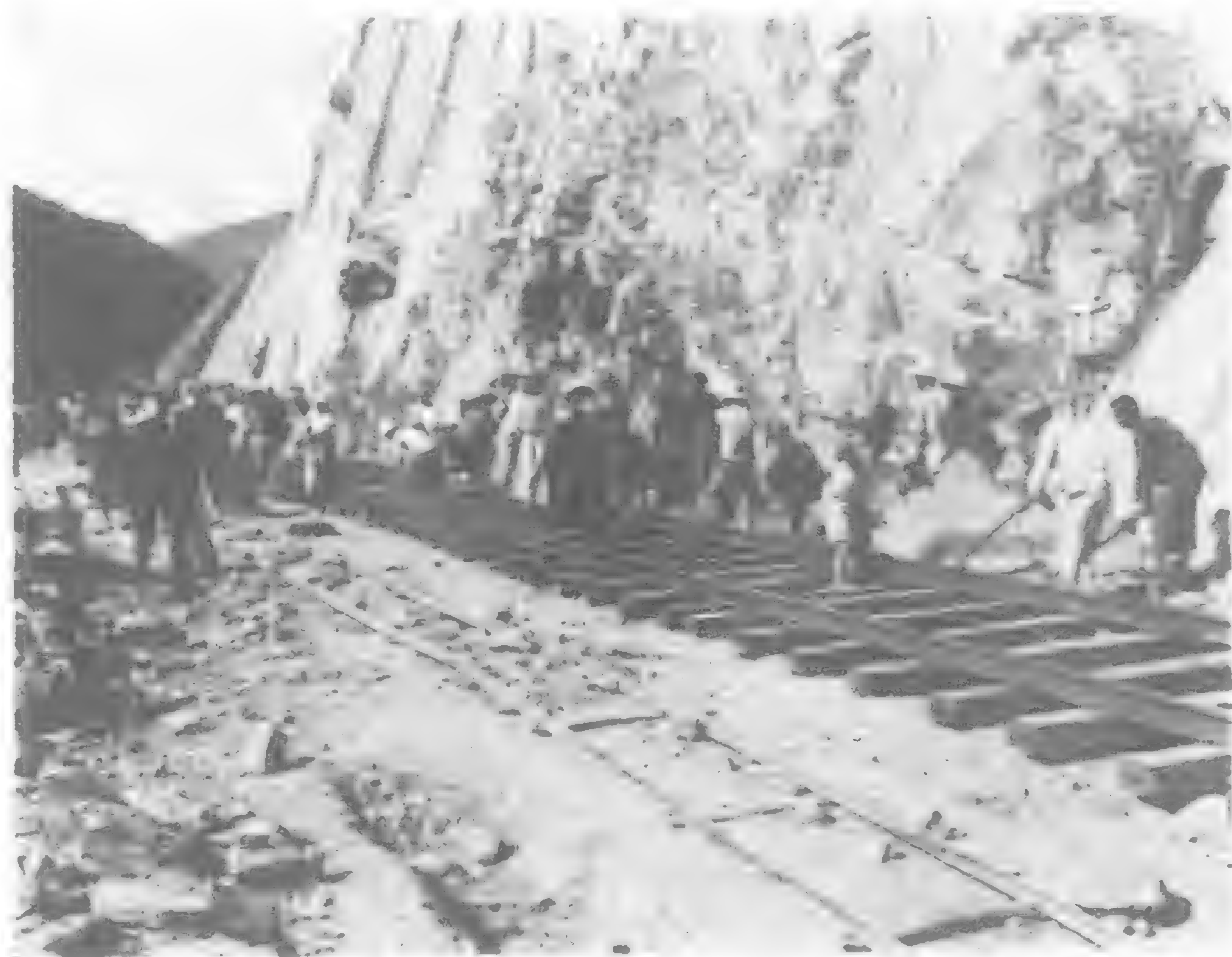
There was an agreement (1930) between the Chinese and British Governments that "all orders for materials required and purchased abroad out of these funds themselves, including bridges, locomotives, rolling stock, rails, and other equipment, will be placed in the United Kingdom of Great Britain and Northern Ireland." British manufacturers of such equipment have therefore obtained valuable orders for the equipment of this line, including rails, bridges, locomotives, and wagons.

Unification of China

The Canton-Hankow Railway runs almost due north through the fertile provinces of Kwangtung, Hunan, and Hupeh. It consists of three sections, each under a separate administration. The



New section of Canton-Hankow Railway showing approach to a tunnel portal



Track laying on the last section of Canton-Hankow Railway to be completed

southern section extends from Wongsha to Lochang, a distance of 169 miles, and includes the 30 miles branch line from Canton to Sam Shui. The northern section comprises 260 miles of main line from Wuchang to Chuchow, and the coal-carrying branch line from Chuchow, to Pinghsiang. Both these sections are in need of repair, particularly the northern section. The construction section extends from Lochang to Chuchow, a distance of 282 miles.

Mr. H. H. Ling, B.Sc., is Director and Engineer-in-chief of the construction section between Chuchow and Shaochow. The writer is grateful to him for much information concerning the work. Mr. Ling thoroughly understands the psychology of the working classes in his own country, and that has enabled him to obtain good results from them. This 31 miles of line was completed and in operation in September, 1933.

In 1929, the middle section remained to be completed before there could be through traffic from Canton to Hankow. Since 1932 the mileage of track laid is 158, and there still remain about 94 miles not quite finished. Most of the earthwork, all the major tunnels, and the main bridges and culverts have been built. All that remains of a major nature is to complete three bridges over the Lo Ho, the Mi Ho, and the Lei Ho, between Chuchow and Hengchow, and five reinforced concrete arch bridges between Ping Shek and Ko Ting.

As many as 100,000 men were at one time employed on the middle section, but the number has been reduced to 30,000 owing to the slowing up necessitated by rapid progress, and the desirability of completing all engineering works at approximately the same time. It is anticipated that, after completion, construction trains will continue to run for a few months in the dual capacity of servicing both engineering and traffic operations. This is the method which has been adopted throughout the whole of construction, and it has proved highly successful. Trains are not booked, but run at times to suit the work. The 32 miles section between Lochang and Ping Shek, which was opened to this sort of operation in September, 1933, is now earning about \$500 per day.

For centuries the highways of China were the waterways. Only those who have travelled inland in China can appreciate the enormous volume of traffic on the rivers, lakes and canals of the country. Reliable authorities have estimated that, in China, 20 per cent of the man-power is engaged in transport, whereas in Europe only five per cent of the man-power is similarly at work. The many rivers and numerous canals that criss-cross the three great river systems in the land are always swarming with native craft. Transport by water—except on the wide rivers—is slow because of the congestion: but “maskee” (don’t worry) is the answer to any criticism of the time factor if made to native boatmen.

China’s main rivers run from west to east. There are three great watersheds with ranges of mountains between them. Railway communication from north to south in China over these mountains is difficult, involving much tunnelling and bridge building. The wide rivers, and the very large number of canals in the flat country between the mountains, also make railway and road construction difficult. The section of the Canton-Hankow line, from Lochang to Chuchow, over the big divide between the Yangtze and the North

River watersheds, proved to be the most difficult of the whole construction work. When planned by American engineers many years ago this section was to have sixty-six tunnels. The Chinese engineers, Messrs. W. C. Lee and P. S. Pui, planned a location along the east bank of the upper course of the North River, on the southern side of the mountain range. Although this reduced the number of tunnels to fifteen, the longest one being 984-ft. through hard rock, this new route increased the expense of protection work.

The design of this section has been criticized by engineers who have seen it, but it must be remembered that money was very limited. There is, perhaps, the possibility of considerable dislocation to traffic during the heavy rainfalls which are a feature of Southern China. It seems rather a small safety margin to place the formation level only 9-ft. above the maximum known river flood level. Heavy rainfall may cause land slips in the shale banks and cuttings.

Over the divide there is a satisfactory maximum gradient of about 1 in 100 for about $1\frac{3}{4}$ miles on each side of the range, which rises, where the railway crosses, to a maximum height reaching 1,161-ft. above sea level.

The feeders for the railway will be the waterways and the new roads; there will be some competition by waterborne traffic, as can be seen by a glance at the maps. However, some of the rivers are shallow in winter and the rapids are difficult.

One-third of this gap section, covering a stretch from Lochang to Chenchow, over the provincial divide, for a distance of 75 miles, is perhaps the most difficult section of this whole system necessitating heavy rock cutting, tunnelling, and construction of extensive retaining walls.

Transport Difficulties

The rock formation is mainly composed of good limestone, either exposed or covered with a few feet of earth. Most of the rock-cutting work has been done with air compressor sets and dynamite. On account of the steep natural side slopes along the river, making the transportation of these machines exceedingly difficult, only portable compressors of light weight could be used. It usually happened that these compressors were mounted on small boats, moving up and down the river as required.

The construction of this section of 75 miles was very much handicapped by the inconvenience of transportation, for beyond Lochang, the North River goes into deep gorges through mountain ranges, and there are only broken paths on the steep hillsides close to the river. The river is shallow in dry seasons, and within 25 miles north of Lochang there are no fewer than eighteen rapids. Small boats with a draught of 18-in. can scarcely go over these rapids and then often meet with disaster. On the north side of the divide, the mountain ranges are more scattered, and there is not even a water course like the North River. The transportation of men and material is exceedingly difficult, by land or by water. The nature of work required a great deal of manual labor at times. Usually contractors had to hire and bring workers in from some distance and then provide for them lodging places and ample food



A fourth-class station building on the Canton-Hankow Railway



Canton-Hankow Railway Station building at Hengchow

supply. This constituted another difficult problem. As the streams are of shallow water, with solid rock bottom and high banks, reinforced concrete arches are most suitable, both from engineering and æsthetic points of view. In certain cases 30 m. and 40 m. reinforced concrete arches are used to advantage. There are, in other places, steel spans with piers 100-ft. in height. This stretch of country is extremely beautiful, with deep gorges, rapids, waterfalls, forests, and, in general, picturesque surroundings. Naturally the gorges added to the difficulties of construction work.

It is of interest to give the minimum cost, as estimated by Mr. H. H. Ling, B.Sc., for the work on this Chuchow-Lochang Section. In general, civil engineering work can be carried out much more economically in China than in Great Britain, because of the low cost of labor; a Chinese coolie would, in all probability, cost about 6d. a working day on this class of work in the interior. Several thousands were employed on the line for about three years.

In Hongkong where labor costs are considerably more than in the interior of China, reservoir construction has been done at about one-fifth the cost in England.



H. H. Ling, Director and Engineer-in-Chief, of the Canton-Hankow Railway, Chuchow - Shaochow Section

MINIMUM ESTIMATES FOR THE CONSTRUCTION OF CHUCHOW-
LOCHANG SECTION OF 251 MILES OF THE
CANTON-HANKOW RAILWAY

Type of expenditure	China fund, in dollars	London fund, £ sterling
(1) Earthwork, earth cutting and filling	3,850,600	
Rock cutting	6,908,500	
Retaining walls, etc. .. .	2,132,100	
(2) Tunnelling	2,398,300	
(3) Bridges and culverts: Masonry .. .	4,895,500	
Steel construction	780,000	170,000
Culverts	1,853,900	
(4) Right of way protection	35,850	
(5) Telephone and telegraph	298,700	10,000
Train signals	119,500	
(6) Track: Sleepers	3,624,900	
Rails	—	329,120
Accessories	—	87,500
Track tools	20,000	1,000
Track laying and ballasting .. .	1,129,200	
(7) Points and crossings	20,000	28,000
(8) Buildings: Head office	50,000	
Station building and platforms .. .	900,000	
Small shops and stores	38,900	3,000
Staff quarters and gang houses .. .	478,000	
Water towers and pumps	150,000	12,500
Coaling stations	75,000	
Turntables	18,000	4,000
Weighbridges	8,000	4,000
(9) Engine sheds and equipment	125,000	120,000
(10) Rolling stock: Locomotives	—	240,800
Passenger coaches	—	192,500
Freight cars	—	300,000
Locomotive cranes	—	10,000
(11) Maintenance during construction .. .	290,000	
(12) Surveying and instruments	215,250	5,000
(13) Land	1,135,000	
(14) General expenses	3,000,000	
(15) Contingencies	961,000	127,580
	\$35,511,200	£1,645,660

This works out at the present rate of exchange at about £15,000 per mile, upon which, considering the very difficult country, the engineers may be congratulated. Very limited funds were available

for dollar expenditure in China: economies were made on adjuncts to the line. It was desired by the engineers to construct a sound track with permanent structures of standard strength. Temporary buildings and shops and equipment essential for immediate necessity have been provided to secure economy.

This brings the story of the work on the Canton-Hankow up to date. In order to appreciate the importance of the completion of this line it should be remembered that Hongkong is the deep sea port, not only for Canton, but for all South China.

For centuries foreign trade with China was restricted to Canton, until Hongkong was ceded to Britain in 1841. That Crown Colony, in tonnage of annual shipping, ranks amongst the four biggest ports in the world. As foreign trade increased in South China, and Hongkong rapidly developed, river traffic between Hongkong, Canton, and other places adjacent to the South China river system increased to an astonishing amount. In addition, during the last quarter of a century there has been a railway connecting Hongkong with Canton, 89 miles long.

Not only has Hongkong grown out of all expectation, but the tiny stream of foreign trade that, after the cession of the Colony to Britain, began to widen its waters beyond Canton, has now spread all over and irrigated every part of China. More important is the fact that, in the post-war days, owing to this foreign trade, the Chinese have become converts to the creed of the applied scientist. It is a complete *volte face* from the contempt of the classical scholars and Court officials of the days of the Empire. The great mass of the Chinese people are practical workers, intensely industrious, cheerful in the face of great adversity, but until recent years were made exclusive by the Great Wall of Chinese (Confucian) literature, reinforced by the buttress of the Taoist and Buddhist creeds. Now they, and their leaders, are beginning to place their faith and their hopes for the future of China in applied science. All over the land is the urge, amongst all the new generation of educated Chinese, to improve China by economic development. There is nowadays no blind opposition from the mass of the population. On the contrary, except where (as with boatmen) machinery competes with human labor, there is glad co-operation, especially in connection with roads, railways, and flood prevention. And it is important to note that the Chinese manual worker is not only industrious and cheerful, but ingenious.

Aviation is popular in China. In two "hops" of about eight hours each passengers can travel by air from Canton to Peiping, and from Shanghai to Chungking—1,350 miles by water on the Yangtze.

In all my varied experiences, including travels in Asia, America, and Europe, I have never seen a more dramatic exhibition of the progress made by man in transport affairs than in 1934 when passing through the wonderful gorges of the giant Yangtze River. We were on a small power-driven vessel, forcing its way up through the rapids. The cliffs of the gorges, in places, rise sheer perpendicular from the bed of the river, there being no foothold on either shore. A gallery was cut into the cliff, well above high-water mark, centuries ago. Junks have been hauled up the rapids by men crawling along these galleries, pulling on ropes, from early times in China's long history. We actually saw about 100 men in the rock gallery pulling a junk up through the swirling waters. The voyage of that junk, we were told, from Ichang to Chungking (300 miles), would take about four weeks or longer. Our power-driven vessel took four days. And as we gazed at the men hauling and crawling along the gallery we heard the drone of an aeroplane overhead, and we knew that the machine with wings did the journey in four hours. Can one imagine a better example to demonstrate that scientific progress has telescoped time?

The farmer in South China hears the roar of the machine in the sky and looks up from his plough in the rice field; the boatman in his junk on the Yangtze now finds the aeroplane a familiar sight; the Chinese peasant working near that greatest structure on earth, the Great Wall of China, is no longer terrified by the sight and sound



Typical long retaining wall along Canton-Hankow Railway



One of the bridges recently completed on Canton-Hankow Railway

of rapid flight overhead. The new roads, the spread of broadcasting, mass education, and native newspapers are acting as propaganda for applied science in China.

Hongkong should benefit by the completion of this Canton-Hankow Railway. Unfortunately, the northern terminus of the Kowloon-Canton Railway is three miles distant from the southern terminus of the Hankow-Canton line. The residents of Hongkong are anxious that the gap of three miles in Canton shall be covered by a loop line, but unfortunately the Chinese authorities have not yet agreed to the scheme, although it is believed that they will do so. When that gap no longer exists there will be through railway communication between the British Crown Colony of Hongkong, in South China, and Calais. And Hongkong will then have the distinction of being a terminus of the world's longest train ride. Unfortunately, the disturbed political situation in countries other than China may interrupt through traffic. That may stimulate construction of the China-Mongolia-Burmah route to Europe. For railways are gradually linking remote cities in Asia. Nor is the idea of through motor-car traffic from Hongkong to Calais now regarded as an idle dream.

It is obvious that the waterways in China will be powerful competitors with this and other lines. Water transport is always cheaper than rail haulage, and China has an enormous length of navigable rivers and canals. Yet when efficiently managed, all existing railways in China have been successful as economic ventures.

The late Sir Maurice Fitzmaurice drew up a detailed scheme for many new wharves, etc., for Hongkong in anticipation of the completion of the Canton-Hankow line. But only a portion of the goods

traffic from the interior will affect Hongkong, for "the economic divide" is half-way along the line at Hengchow. North of that divide marketable commodities will find their way to the Yangtze ports. Yet Hongkong, as the largest port in South China, must reap some benefit from the new traffic. Large quantities of wood oil, cereals, fruits, and eggs will move south. Metals and mineral oils and coal will, in time, find an outlet to the sea at Hongkong when the mines are developed. The return haul should carry machinery, oils, manufactured goods, salt, flour, etc., from Hongkong into the interior.

The really important facts in China to-day are that there is a great urge, in many parts of that huge territory, to build railways and roads, and that a large number of capable Chinese engineers are doing admirable construction work in the country. The constant bugbear of the engineer—finance—is the main difficulty now that blind opposition to applied science has been changed into enthusiasm for it in Chinese official and commercial circles. Financial aid is

available, but international rivalry and internal jealousies in China still appear to prevent its use. In spite of that fact progress is being made. We can be sanguine that there will be a great deal of engineering construction work in China completed in the next few years. The deeply seated anti-Japanese feeling is unifying the Chinese and increasing their faith in the works of the engineer. They now are persuaded that applied science will prove the salvation of their troubled land and one inevitable result must be that the demand for capital goods will increase the foreign trade of China. And in that trade British engineering firms should find a valuable export market for their products.



Showing a bridge on the Canton-Hankow Railway at approach to tunnel portal

RAILWAY CONTRACT TO FRANCE

The signing of a Sino-French agreement for the construction of a railway linking Chengtu with Chungking, on July 20, is reported from Tokyo. The contract provides for a loan of Fr.26,000,000 to the Central Government, under a

guarantee of the Central Bank of China, the Bank of China, the Bank of Communications, and the Salt Industrial Bank. The report added that the project would be supervised by French engineers.

Tung Oil and its Trade Development in China*

TUNG oil is a drying fixed oil obtained by expression from the seeds of several species of *Aleurites*. In China it is used chiefly for mixing with paints, for cleaning and caulking boats, for covering and thus preserving wood-work of all kinds and in making varnish and lacquer, as well as in dressing leather, in making soap, for lighting purposes, in the production of lampblack, used in making Chinese ink, and as a medicine, chiefly in making plasters and for outward application to parasitic skin diseases and wounds, and to scalds and burns. In foreign countries, it is used for the same purposes as linseed oil, that is, in making varnish, paint, lacquer, oil-cloth, linoleum, etc.

The rapidly growing demand for Chinese wood oil abroad, especially the United States, awakens a nation-wide interest among Chinese people in the industry, which is now assuming a far greater importance than many of the other Chinese leading industries, not excluding even silk-manufacturing. On the subject of tung oil many articles are written, in magazines as well as in papers, while the number of tung tree plantations increase rapidly in growing districts.

According to a very recent estimate, there is in China now 852,500 *shih mou* of land under tung trees, producing 1,705,000 piculs of oil a year, of which about 700,000 piculs is consumed at home, the remainder going abroad.

Among the provinces producing tung oil, Szechuen is of the foremost importance, with an annual production of more than 500,000 piculs, followed in order by Hunan, Chekiang, Kwangsi, Kuichow, Shensi, Fukien, Anhwei, and Kiangsi.

Szechuen

The annual production of tung oil in Szechuen amounts to from 500,000 to 700,000 piculs, according to an estimate made by the Local Bank of Szechuen. Tung trees in China grow best between longitude 120° E. and latitude 23° and 33° N., in which zone lies the greater part of the province. The approximate number of the trees grown as well as the average annual output of oil in those districts are shown as follows:

	No. of Trees	Annual Output of Oil (piculs)
Hochuan	1,000,000	20,000
Wanyuan	600,000	12,000
Tahsien	500,000	10,000
Kuangan	400,000	8,000
Hsienhan	250,000	5,000
Chuhsien	200,000	4,000
Hsichung	200,000	4,000
Langchung	150,000	3,000
Yenting	150,000	3,000
Nanpu	100,000	2,000
Suining	100,000	2,000
Kiangyu	100,000	2,000
Chungking	500,000	10,000
Kiangtsin	500,000	10,000
Luh sien	500,000	10,000
Chikiang	400,000	8,000
Hokiang	350,000	7,000
Ipin	300,000	6,000
Pingshan	200,000	4,000
Loshan	200,000	4,000
Junghsien	1,000,000	2,000
Pengshui	2,000,000	40,000
Yuyang	2,000,000	40,000
Hsiushan	2,000,000	40,000
Peiling	500,000	10,000
Nanchuan	550,000	11,000

The principal tung tree growing districts in Szechuen lie in regions along the Yangtze tributaries, covering Luhsien in the extreme west, Loshan on the upper reach of the Minkiang in the north and stretching to the Kuichow border at the farthest south. Luhsien is the center of distribution in the Upper Yangtze Valley, from whence the oil is shipped to Wanh sien or Chungking, and finally to Hankow for export.

Tung trees are also abundantly grown in the Chialingkiang valley. Chungking, located at the crossing of the Yangtze and the Chialingkiang, is a natural oil trading center, occupying almost as significant a position as Wanh sien, the premier tung oil market in the province. In fact, years ago, oil from Eastern Szechuen, of which Wanh sien is now the preferred transshipping port, was always first sent to Chungking to be distributed to the consuming districts, within or without the province.

The best market abroad for Wanh sien tung oil is the United States, with European countries and Japan the next good customers. More than 60 per cent of the export trade in the city passes through



A fine example of a bearing tung tree

the hands of an American firm, the Werner G. Smith Company. Among the domestic markets, Shanghai, Hankow, Chinkiang, Nanking, Wuhu, Kiukiang, Anking, Tatung, Ningpo, and Shashih are comparatively important, but as a matter of fact, only a small quantity of the oil going to Shanghai and Hankow is really consumed in China, the greater portion being transhipped to foreign countries.

The oil market at Wanh sien is entirely controlled by conditions of export in Hankow. The demand for oil at Wanh sien increases and decreases with the expansion and shrinkage of Hankow's export trade, on which also depend the oil prices. The following is a list of tung oil quotations prevailing at Wanh sien from 1917 to 1935 (in taels prior to 1930 and in dollars after that year):

			Highest	Lowest	Difference	Medium
1917	..	..	11.25	6.80	4.45	10.26
1918	..	..	11.50	7.00	4.50	8.20
1919	..	..	11.00	7.00	4.00	10.68
1920	..	..	11.00	9.00	2.00	10.37
1921	..	..	14.50	9.80	4.70	11.26
1922	..	..	20.00	14.10	5.90	15.63
1923	..	..	32.00	14.00	18.00	22.98
1924	..	..	26.00	12.60	13.40	18.31
1925	..	..	25.00	14.10	10.90	15.59
1926	..	..	24.50	17.30	4.20	20.34
1927	..	..	26.00	15.00	11.00	15.46
1928	..	..	27.00	16.80	10.20	17.18
1929	..	..	28.00	17.00	11.00	24.33
1930	..	..	23.08	13.45	9.36	15.00
1931	..	..	26.35	21.20	5.15	24.10
1932	..	..	25.80	17.80	8.00	22.00
1933	..	..	27.80	16.10	11.70	20.21
1934	..	..	35.20	19.40	15.80	27.70
1935	..	..	70.00	30.20	39.80	40.19

*Chinese Economic Journal.

The above figures indicate the fact that prior to 1921, tung oil prices at Wanh sien were comparatively low on account of small demand abroad, many of the prospective oil using countries being then engaged in war operations. From 1922 downward, the market showed considerable improvements, being favorably affected by the industrial recovery in foreign countries, especially the United States, though in 1930, when the world economic depression had its strongest effect on every industrial nation, there came again a heavy fall in prices. The gradual success of the National Recovery Act of the United States in reviving industrial activities in that country, however, had given such a new and large demand for Chinese tung oil that the market at Wanh sien became unusually active last year, with prices reaching an unprecedented level of \$70 a picul.

Another fact to be noted in the above table is that the difference between the highest and the lowest prices is in many years exceedingly large, indicative of the enormous range of fluctuation there often is in oil quotations at Wanh sien. This is, however, not due so much to the change in the local conditions of supply as to that in the extent of American demand. Consequently, it is on the United States that our market depends, and it follows, therefore, that unless we could establish a firm standing in that country, the present trade prosperity is but one of a very momentary nature.

The great increase of the tung oil export from Wanh sien during recent years is indicated in the following table, shows the quantity and value of the annual outward shipments of the oil from that city from 1917 to 1935 :

	Quantity (piculs)	Value (Hk. Tls.)
1917	31,180	314,606
1918	64,765	582,885
1919	55,375	581,438
1920	45,496	439,036
1921	63,932	707,727
1922	230,290	3,539,626
1923	244,175	5,518,355
1924	263,638	4,745,484
1925	274,923	4,214,683
1926	178,366	3,567,321
1927	193,472	2,940,775
1928	324,492	5,480,856
1929	263,340	6,320,168
1930	312,555	4,688,326
1931	230,355	3,778,290
1932	280,796	3,281,331
1933	332,263	\$8,415,145
1934	128,936	\$4,983,661
1935	311,634	—

Market conditions in Chungking, the second tung oil center of Szechuen, are essentially the same as Wanh sien, being subject to the same outside influence, namely, that of American demand. Here, oil comes from three principal sources, viz., northern Szechuen, the Upper Yangtze districts and the Lower Yangtze. The first named embrace such places as Wanh sien, Hsienhan, Tahsien, Chuhsien, Nanpu, Langchung, Kiangyu, Nanchung, Yenting, and Pengchi. The oil is first transported to Hochuan at the mouth of the Chia-lingkiang by water by way of the Paho, the Chuho and the Peikiang. Formerly, the product of Tahsien, Hsienhan and Wanh sien was seldom sent to Chungking for distribution, Wanh sien being a much nearer market. But, since the removal of the many miscellaneous



A three-year-old tung oil tree showing the blossoms which appear in early spring, preceding the leaves. The blossoms, like apple blossoms, are white with a tinge of pink

taxes on this more distant route, most producers have grown to prefer Chungking to the other market.

The Upper Yangtze districts indicate such regions as Tsung-hsien, Loshan, Pingshan, Ipin, Luhsien Nanlohsien, Hokiang, Kiangtsin and Kikiang. The transportation of oil depends largely upon waterways, including the Kikiangho, the Chihshuiho, the Yungningho, the Changningho, the Minkiang and the Tokiang. As a rule, shipments are first collected at Ipin, Luhsien and Kiangtsin before forwarding to Chungking.

As to the Lower Yangtze districts, the principal tung oil regions consist of Nanchuan and Peiling, two-thirds of the oil collected at the latter city, however, being destined for Wanh sien. According to an estimate made by an exporter in Chungking, the arrival of tung oil at the port from the three principal sources of supply amounted in 1935 to 84,000, 33,600 and 33,600 piculs respectively, while the total export from the port in the year aggregated 94,325 piculs.

The development of the tung oil trade at Chungking may be seen from the following Customs statistics concerning the export of the product from the port from 1913 to 1935 :

Year	Quantity (quintals)	Value (dollars)	Year	Quantity (quintals)	Value (dollars)
1913	34	809	1926	33,548	1,659,994
1914	5	114	1927	36,995	1,800,027
1916	114	2,776	1928	21,707	1,074,074
1918	2	105	1929	67,049	4,045,085
1920	20	732	1930	102,661	4,762,320
1921	54	1,569	1931	32,586	1,343,644
1922	1,133	27,707	1932	65,219	3,056,274
1923	13,466	675,782	1933	74,849	3,466,387
1924	50,127	2,271,067	1934	28,211	1,192,663
1925	39,451	1,889,141	1935	94,325	6,512,180

In reading the preceding table, one should make due allowance for the inaccuracy occasioned by smuggling or by shipping oil without passing through Customs, when it is destined for other provinces. However, the table, inexact may it be, provides sufficient data to indicate the general trend of the trade. During the period of the Great War, the business was very insignificant, and even in 1918, when the War had ceased, the export from the port was only two quintals. It is after 1922 that a big development has been noticed. While 1930 is the year when the volume of shipment was the largest, the total value reached the highest level in 1935, during which the demand for Chinese tung oil by the United States was unusually brisk. The rapidity with which oil prices advanced during the past three or four years on the Chungking market is shown in the following list of quotations :

	1933			1934		
	Highest	Lowest	Normal	Highest	Lowest	Normal
January	\$22.80	\$21.80	\$22.00	\$21.00	\$21.00	\$21.00
February	23.60	22.00	22.00	—	—	—
March	23.00	22.50	22.70	—	—	—
April	22.00	21.60	21.80	25.20	22.68	25.00
May	21.60	21.00	21.00	18.60	17.00	17.00
June	24.00	22.00	22.00	28.40	27.80	28.00
July	25.00	14.20	22.00	19.16	18.90	18.00
August	25.50	24.50	24.00	32.55	29.60	29.00
September	25.50	24.60	25.00	—	—	—
October	26.00	23.60	24.00	34.00	23.60	25.00
November	24.80	21.20	22.00	34.20	28.00	30.00
December	—	—	—	32.50	29.80	30.00

	1934			1935		
	Highest	Lowest	Normal	Highest	Lowest	Normal
January ..	\$37.80	\$35.60	\$37.00	\$44.80	\$42.60	\$43.00
February ..	—	—	—	56.80	43.80	47.00
March ..	—	—	—	—	—	—
April ..	27.10	25.10	27.00	—	—	—
May ..	40.40	37.25	40.00	—	—	—
June ..	40.90	40.40	41.00	—	—	—
July ..	47.40	39.80	40.00	—	—	—
August ..	54.00	48.80	54.00	—	—	—
September ..	74.00	50.00	60.00	—	—	—
October ..	78.40	42.50	53.00	—	—	—
November ..	53.80	40.00	48.00	—	—	—
December ..	48.40	41.00	44.00	—	—	—

Hunan

Hunan ranks only next to Szechuen in the production of tung oil, which is the chief export of the province. The growing importance of the industry in the province is revealed by the fact that in 1912 tung oil represented only 10.66 per cent of the province's total export trade, decreasing in 1916 to 2.13 per cent, but rose in 1921 to 17.98 per cent and further expanded in 1926 and 1929 to 33.56 and 44.93 per cent respectively, while in recent years it has been about 40 per cent. The principal ports of export are Changsha and Yuehchow, from which the shipments sent out during the past score of years were as follows:

	QUANTITY			VALUE			Total Ex-ports from Hunan (HK. Tls.)	Percent-ages of Total Exports
	Changsha (Piculs)	Yuehchow (Piculs)	Total (Piculs)	Changsha (HK. Tls.)	Yuehchow (HK. Tls.)	Total (HK. Tls.)		
1912	122,049	9,077	131,126	1,288,837	82,056	1,370,893	12,861,355	10.66
1916	310	48,786	49,096	3,441	383,458	386,899	18,147,291	2.13
1921	1,265	219,315	220,590	16,432	3,125,381	3,141,813	17,496,872	17.99
1926	16,908	328,876	345,784	745,330	8,622,080	9,367,410	27,913,624	33.56
1927	37,193	247,686	284,879	640,463	6,687,522	7,327,985	23,858,300	30.71
1928	23,155	399,371	422,526	494,591	10,783,017	11,277,608	30,277,981	37.25
1929	38,606	471,587	510,193	706,104	12,261,264	12,967,372	28,818,250	44.93
1930	29,267	459,654	479,921	636,264	11,266,350	11,902,614	27,326,078	43.56
1931	13,527	310,115	323,642	242,187	5,482,550	5,724,737	18,409,108	31.10
1932	9,617	308,683	318,300	157,847	5,992,042	6,149,879	15,461,621	39.78
1933	12,460	342,661	355,121	164,409	4,902,839	5,067,248	13,280,954	38.46
1934	28,045	133,040	161,085	939,061	4,290,554	5,229,615	—	—

Tung oil produced in the province is red and white. The white is actually light yellow or golden in color, and is considered the best by European and American consumers. The red variety or *hung yu*, as is commonly called by Chinese merchants, is translucent but sticky, and remains in a liquid state even in winter. It is chiefly sold in Kiangsu and Chekiang. There is another variety, dark brown in color, and known as black tung oil, the quality being inferior to the white. Another variety, *kuang yu*, has a low point of evaporation and is largely used in polishing as a drying agent. The *hsin yu* of Szechuen is sometimes also shipped out through Hunan.

The oil-producing districts are mostly in the Li, Yuan and Hsiang valleys. In the Li valley the most important centers of production are Lihien, Tajung, Yungshun, and Tsuli, the Yuan Valley includes Yuanling, Chihchiang, Chienyang, Huitung, Tsinghsien, Tungtao, Suining, Mayang, Chenchi, Hsupu, Fenghuang, Chienchen, Luchi, and Yungshui, while Ningyuan, Taohsiang, Yungming, Lanshan, Chianghua, Chiaho, Hsintien, Kuivang, Linwu, Laiyang, Changning, Hengshan, Changsha, Liuyang, and Liling are in the Hsiang Valley.

Tung trees are mostly found in the western part of the province and the districts

bordering Szechuen and Kuichow. The annual oil production is estimated at 500,000 piculs, most of which is produced at Yungshun, Paotsing, Luchi, Huitung, Taohsien, Tsinghsien, Chihchiang, and Yungshui.

The chief markets handling tung oil in Hunan are Changsha, Changteh and Tsinshih. Supplies from southern Hunan go to Changsha, while those from Hunan go to Changteh, and the market for supplies from the Li valley is Tsinshih.

Chekiang

As mentioned above, Chekiang ranks as one of the principal wood oil producing provinces, next in importance only to Szechuen and Hunan. The annual production of oil by the province was estimated at 200,000 piculs during normal years which figure must be approximately right also for the two years succeeding, though some increase was not unlikely, in consideration of the enhanced demand abroad lately for Chinese tung oil.

Tung oil is produced in many districts of Chekiang, especially in hilly regions, such as Yutsien, Changhua, Tunglu, Lanchi, Shouchang, Pukiang, Kiangshan, Changshan, Chuhsien, Kaishua, Shunan, Shuiian, Kinhua, and Iuwu. Most tung trees found in the province are *Aleurite Fordii*, known in Chinese as *san nien tung*, or "three-year tung tree," the name being derived from its extremely rapid growth, beginning to flower and bear fruit when three or four years old. The yield of the tree, however, reaches its height from the fifth to the tenth year, after which it begins to decline, and trees over thirty years of age no longer bear fruit, and are usually cut down for fuel.

Though quite extensively cultivated, there are very few large plantations, since Chekiang farmers do not consider tung seed as a regular crop, but a subsidiary one. In fact, tung trees are merely planted in places where no other crop can be raised. The output of the province will, accordingly, certainly increase when farmers realize that tung oil may be more profitable than other crops.

It is in acid soil containing a large amount of organic matter that the tung tree grows well. The soil in most places in Chekiang is just the kind. Thus, a careful analysis of the soil at Huangyen shows the content of organic matter being as large as 6.44 per cent, while that of Hsienchu, Nantien, Tinghai, and Wukang is 4.57, 6.20, 4.39 and 4.44 per cent respectively.

Tung tree plantations in Chekiang aggregate about 90,000 mou, and on an average, every mou yields about 200 catties of oil. A single tree yields from two to ten catties of seeds (varying according to the soil and other local conditions, the average being five or six catties. Since Chekiang farmers do not devote their best land to tung tree cultivation, and very little time and labor is spent on it, the production per tree is much lower in Chekiang, compared with the results obtained at Gainsville.

There are no less than five varieties of tung oil produced in Chekiang. The best is of light green color, known as *ton yu*, or "oil of first extraction." The *er yu* and *san yu*, which are the products of second and third expressions, are, while inferior to *ton yu*, much better than "mixed oil" and "adulterated oil," the last two named being respectively the mixture of two or all the three first named oils and the "mixed oil" adulterated with *tsing yu* and the like. The price at producing places range between \$16 to \$20 per picul, while in Shanghai, it is about from \$25 to \$30. Within the province,



A grove of young tung trees in the dormant season. The fruit usually drops off in October and are left on the ground until dry. The leaves fall in November

the most important oil markets are Lanchi, Kinhua, Chuhsien, Yungchia, Ningpo and Hangchow, but none of them can compete with Shanghai in the volume of business handled.

The Chekiang Provincial Government is praiseworthy for its unwearied effort in the promotion of the tung oil industry. It works in two directions: namely, the increase of tung tree plantations, and the improvement of oil quality. To achieve the first object, the Government attempts a full exploitation of unused land, employing at the same time agricultural experts to select species, and study the methods of transplantation as well as of protection against insect pest. Equal success has also been brought about in the raising of oil quality by giving extractor directions regarding the choice of raw material and the methods of expression, etc.



A record crop from a four-year-old tree, 40 pounds dry weight, eight pounds tung oil

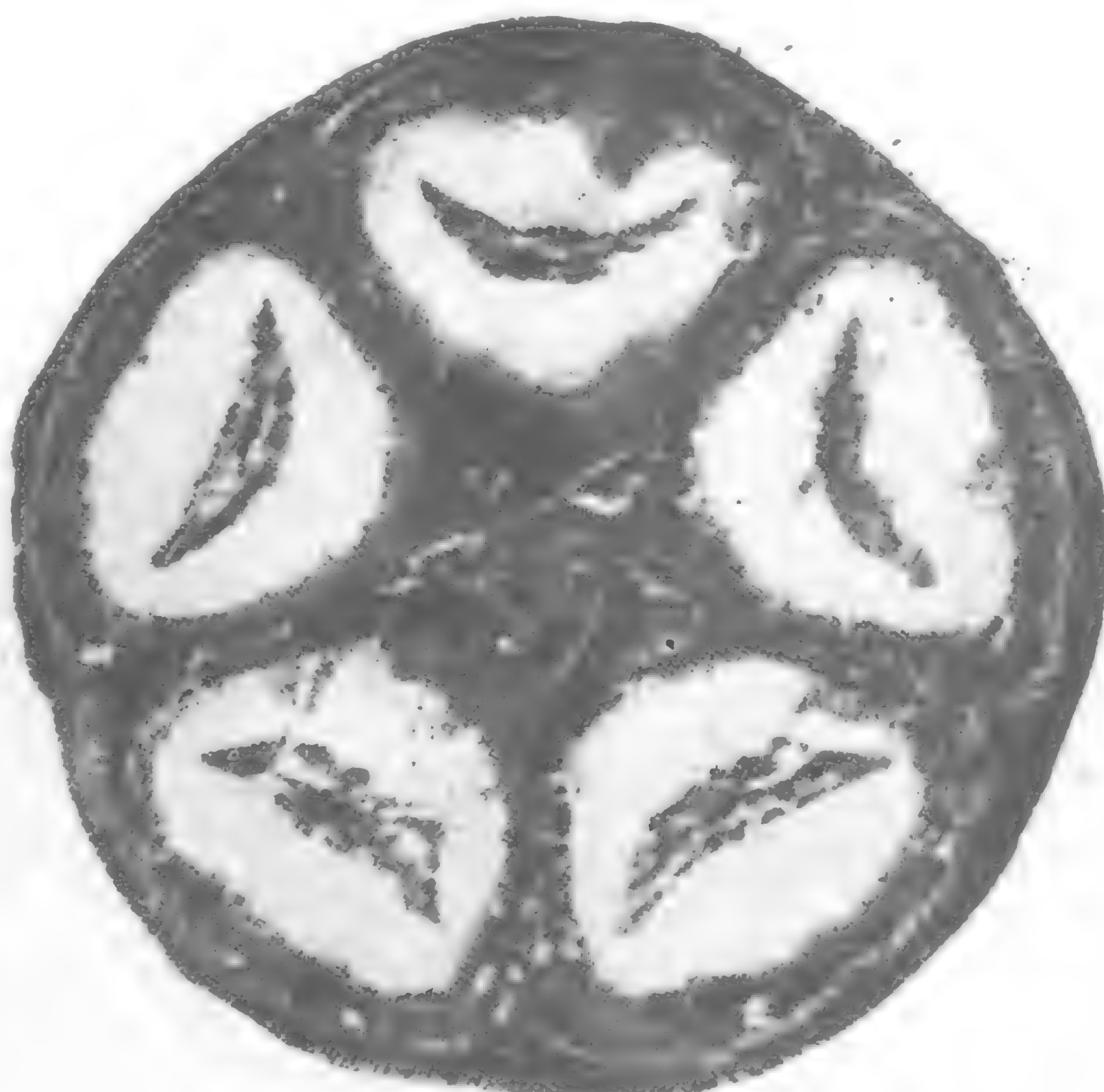
Facts on Tung Oil Export

As has been mentioned above, tung oil has been occupying even a more significant place in China's export trade than silk and tea. In fact, in 1935, China's export of tung oil amounted to as much as 7.22 per cent of her total outward shipments, as against 6.99 per cent for raw silk, 5.57 per cent eggs and egg products, 5.50 per cent metals and 5.14 per cent tea. The rise of tung oil to the first position among China's principal export commodities came incredibly fast, for only one year before tea, cotton yarn, metals, eggs and egg products, skins and furs and raw silk all came ahead of it, though in 1933, it occupied the fifth place.

The export trade in tung oil is one of comparatively recent development. The first year during which records of the export were made is 1869, the United States being the only buyer. Since then, a steady increase in the volume of shipments has been noticed until the commodity came up to the position of first importance. The table below shows our annual tung oil sales abroad from 1912 (the first year of the Republic) to 1935:—

	Quantity (piculs)	Value	
		Hk. Tls.	Dollars
1912 ..	582,815	5,823,204	8,734,806
1913 ..	463,647	4,001,503	6,002,254
1914 ..	438,867	3,736,275	5,604,412
1915 ..	310,344	3,012,343	4,518,514
1916 ..	515,173	5,511,418	8,267,127
1917 ..	401,361	4,835,908	7,258,862
1918 ..	488,852	5,975,926	8,963,889
1919 ..	613,455	7,960,968	11,941,452
1920 ..	540,716	6,737,191	10,105,789
1921 ..	419,549	5,466,430	8,199,645
1922 ..	745,565	10,888,130	16,332,195
1923 ..	836,897	17,477,420	26,216,130
1924 ..	896,038	17,714,713	26,572,070
1925 ..	894,073	17,450,104	26,173,156
1926 ..	748,184	14,962,314	22,443,470
1927 ..	910,294	21,970,947	32,956,421
1928 ..	1,094,299	23,302,221	34,953,332
1929 ..	1,069,650	23,519,792	35,279,553
1930 ..	1,167,255	30,546,872	45,820,208
1931 ..	818,874	18,883,381	28,322,075
1932 ..	802,769	12,655,772	23,161,233
1933 ..	1,246,847	15,495,226	30,261,269
1934 ..	652,836*	—	26,216,683
1935 ..	738,865*	—	41,582,879

The preceding table reveals at least two important facts. First, the increase



Cross section of tung fruit

in China's tung oil trade has been exceedingly steady and rapid, the value represented by 1935 being almost five times that registered in 1912 and nine times that in 1915, the worst year for the business during the past 25 years. In the second place, the figures show that the increase of business has been remarkable since 1927, a very encouraging fact, considering the serious effect of the world economic depression during this period upon other lines of trade.

The United States is the earliest buyer of Chinese tung oil. Sales to other countries started only upon the development of the

varnish industry in Europe and Japan.

In 1917 there were only 16 countries and ports buying tung oil but in 1919 the number increased to 18, and further to 26 in 1933. With regard to the share taken by each country, the increase made during the 18 years, 1917-1935, was tremendous in many cases. Thus, while Hongkong took only Hk. Tls. 699,770 (equivalent to approximately \$1,049,650) worth of the commodity in 1918, its purchase in 1935 amounted to \$4,129,109, almost four times. In the like manner, the British buying was Hk. Tls. 233,382 (\$350,070) as against \$2,117,974; the French, Hk. Tls. 35,033 (\$525,500) as against \$1,778,769; the Netherlands, Hk. Tls. 32,364 (\$485,460) in 1919 as against \$1,261,417 in 1935. However, the development of trade with the United States was even faster than any of the above-mentioned countries. The value of export advanced from \$5,532,700 (Hk. Tls. 3,688,474), as was recorded in 1917, to \$28,057,248 last year. In fact, that country has always taken the leading position among Chinese tung oil buyers almost from the very first year when the commodity was known to have been shipped out. Consequently, it is on the United States that China chiefly depends for oil sales abroad. The following table is appended to show the trend of trade with that country since 1912:—

	Total Export from China (piculs)	Export to America (piculs)	Percentage of Export to America
1912 ..	582,815	307,927	53
1913 ..	463,647	311,246	67
1914 ..	438,867	365,983	61
1915 ..	310,344	215,921	69
1916 ..	515,173	404,725	79
1917 ..	401,361	301,306	75
1918 ..	488,852	380,436	78
1919 ..	613,455	309,161	50.5
1920 ..	540,716	379,952	70
1921 ..	419,549	223,207	53
1922 ..	745,565	616,321	62.5
1923 ..	836,897	593,624	71
1924 ..	896,038	627,040	70
1925 ..	894,073	706,093	79
1926 ..	748,184	540,013	72
1927 ..	910,294	572,316	63
1928 ..	1,094,299	740,239	67.6
1929 ..	1,069,650	735,244	68.7
1930 ..	1,167,255	874,006	75
1931 ..	864,864	549,600	63.5
1932 ..	802,769	495,792	60.4
1933 ..	1,246,847	879,100	70.5
1934 ..	652,836*	410,390*	62.9
1935 ..	738,865*	491,999*	67.47

Reason for Business Prosperity in 1935

Customs statistics reveal that China's export of tung oil showed a

*Quintals.

very remarkable increase in 1935 as compared with the previous year's shipments. During the year, China shipped out 738,865 quintals of tung oil, as against 652,836 quintals exported the preceding year. In value the 1935 export amounted to \$41,582,879, an increase of \$15,366,195 as compared with the \$26,216,683 of 1934, while the average price per quintal also advanced from by \$16.12, from \$40.16 to \$56.28. In various aspects, therefore, the tung oil trade showed an improvement such as has not been witnessed before. One fact, however, must be noted that the advance in value was much greater than the increase in quantity, the following table making this clear:—

	Quintals	Value	Average Price per Quintal
1932 ..	485,350	\$23,161,233	\$47.70
1933 ..	753,837	30,261,269	40.10
1934 ..	652,836	26,216,683	40.16
1935 ..	738,865	41,582,879	56.28

Mr. P. Y. Ho, formerly Director of the Bureau of Foreign Trade, attributed the 1935 prosperity to four reasons. In one of his articles on the subject, he said:

"The United States, the largest market for Chinese tung oil, usually absorbing no less than 60 per cent of our total export, showed an increase. Prior to the economic depression, the average annual import of tung oil into the United States amounted to approximately 120,000,000 pounds, falling to about 8,000,000 pounds when the depression came. During the past two years the various American chemical industries have enjoyed a steady revival of business, and the demand for tung oil has been growing; in fact, during 1933 and 1934, the consumption had already recovered to the former 100 million pound mark. Owing to further progress of economic recovery during 1935, the demand for tung oil has again reached normal proportions, and China's shipments have accordingly increased in quantity.

"Since the outbreak of Italo-Ethiopian hostilities, and in preparation for a possible emergency, European countries are actively buying industrial supplies, among which tung oil occupies an important place.

"Chinese tung oil is largely produced in the inner provinces from which, owing to insufficient transportation facilities, goods are not easily brought out. At the centers of distribution, storage equipment is likewise inadequate. Consequently, when foreign orders increase, there is always a shortage of immediate supply, and as a natural consequence those who have got some stocks in hand will not sell unless offered attractive prices.

"During the nine months of 1935 under review, exchange was comparatively low, and the price-indexes of Chinese export commodities showed a general rise. According to the *Shanghai Price Index Number*, published by the National Tariff Commission, the average price index for the first nine months in 1934 was 71.5 as against 74.5 for corresponding period of last year (1935), 1926 being



The cluster type of tung nuts showing heavy fruiting character on terminals

taken as the base. The index for goods of production was 52.5 for 1934, rising last year to 57.2. Consequently, it is a matter of course that the price of tung oil should have risen in accordance with the general rising tendency of prices."

Mr. Ho is among the very few writers who have given the subject such a complete study, and while the truth of his statements is irrefutable, it is discouraging to note that none of the facts he brought out as having a strong bearing on the last year's boom in the tung oil trade seems to possess any lasting value. Here again, nobody has ever written so clearly as Mr. Ho, who said in the same article:

"While nobody can fail to see these encouraging aspects, nevertheless it is far too early to feel confident about the future. Business prospered in 1935 because of greatly increased prices, which in turn were due to a sudden rise in demand abroad and our inability to gather in the specified time sufficient supplies to meet the urgent demand. In other words, instead of being the result of our own efforts to develop the foreign market, the progress seen in the tung oil trade was the outcome of a chance increase in demand by foreign countries. Prosperity was the result of factors quite beyond our control, and was an abnormal boom, not a regular development of commerce."

Neither, however, should we feel too pessimistic about the outlook of the business. Indeed, many foreign countries are growing tung trees, but at least for the time being, the small quantity they are able to produce is far from being enough to be self-sufficient. Therefore, a bright future still awaits us if we could make use of the opportunity now presented us to improve our methods of production and marketing.

LOCOMOTIVES ADRIFT ON STEAMER DECK

Captain H. Nyegaard, master of the Norwegian tramp *Othander*, had a hair-raising experience when locomotives carried on his ship as deck cargo broke adrift during a hard spell of the south-west monsoon, east of Sokotra. Four 72 ton locomotives from Alsace-Lorraine, where they had been built to the order of the Chinese Government, were loaded at Antwerp on the *Othander's* well decks—two forward and two aft—and strapped down to the deck with hawsers. The engines fitted into the spaces between hatchways and bulwarks, leaving only a few inches on either side, the only passage fore and aft for the crew being over the hatch-covers. To secure the giants, holes were drilled into the steel skin of the ship so that bolts could be fastened to it and hawsers run to the locos, which were put on plank beddings and again fastened to one another across the hatchways by thwartship wire hawsers. In addition, four tenders, each about 30-ft. long, were lowered into

the *Othander's* holds, to go with the locos to their Chinese owners and drums of lubricating oil were also stowed and strapped on deck.

All went well, reports the *Straits Times*, until the *Othander* was off Sokotra Island, just outside the Gulf of Aden. The south-west monsoon was then blowing and the Indian Ocean sent wave after wave over the little steamer from abeam, until she was practically under water all the time. Suddenly Captain Nyegaard saw one of the locos forward lift and jump about as if it had come to life, and shortly afterwards two more locos took up the dance. A quick examination showed that nine hawsers in all had parted under the strain. There was nothing to do but to heave to for several hours, while the crew feared that one of those dancing objects might smash in the hatchway and allow the sea to pour into the holds. Fortunately nothing more happened before the waves subsided.

Soviet Kaleidoscope

By LOUIS FISCHER in the "British Russian Gazette and Trade Outlook"

I HAVE just completed another journey of five thousand miles from Leningrad down to Armenia and back to Moscow. Everywhere there is change and progress; nowhere stagnation or retrogression. Despite a steady rise in the value of the rouble, more construction is going on to-day than in the pioneer upbuilding period of the first Five Year Plan. Moreover, innumerable industrial units whose foundations were laid in that period or in 1933 or 1934 are beginning to produce.

Among the enterprises which have been finished in 1935 or will be finished in the remaining months of this year are electric power stations with a capacity of 817,000 kilowatts; forty-one mines with a capacity of 23,260,000 tons and an immediate output, in 1935, of 5,770,000 tons; 1,292 oil wells, of which more than half have already come in; twenty-three mammoth oil refineries and cracking plants; iron and steel mills which will increase the nation's potential output by 1,790,000 tons of pig iron (10,400,000 tons were actually produced in 1934); 2,200,000 tons of steel, and 1,796,000 tons of rolled steel; several score of large copper, zinc, aluminium, lead, nickel and magnesite plants which in some branches double the U.S.S.R.'s production; three mills with an output in 1935 of 16,600,000 meters of textiles and many smaller clothing factories; two factories producing 8,000,000 square meters of glass a year; two cement ovens producing 270,000 tons annually; sugar refineries, meat refrigerators; stock yards; two canning factories, already working, with a capacity of 25,300,000 cans and an output in 1935 of 7,000,000 cans; two plants opened in June capable of turning out 1,300 tons of dry milk a year; 1,749 kilometers of paved roads; 397 kilometers of new railroads; 1,990 kilometers of double tracking; four new railway bridges; 5,000 kilometers of track renewal and 528 kilometers of steam lines to be electrified; one plant at Nizhni Tagil producing 27,000 four-axle freight cars annually; a plant producing 50,000 tons of bridge work annually; a plant at Ufa to make 30,000 motors annually; the Lugansk works now able to produce 470 locomotives annually, dwellings with a floor space of 8,300,000 sq. meters, and 34 hotels.

These are the "Giants of 1935." In addition, hundreds of lesser establishments are rising over the face of the country. I saw many of them in the cities I visited, from railway cars, and during cross-country automobile trips. The upbuilding of the U.S.S.R., which has proceeded at an unprecedented pace since 1929, is only now acquiring its real momentum.

Most factories are well built, with plenty of light and air and much garden space, but the quality of new homes is infinitely

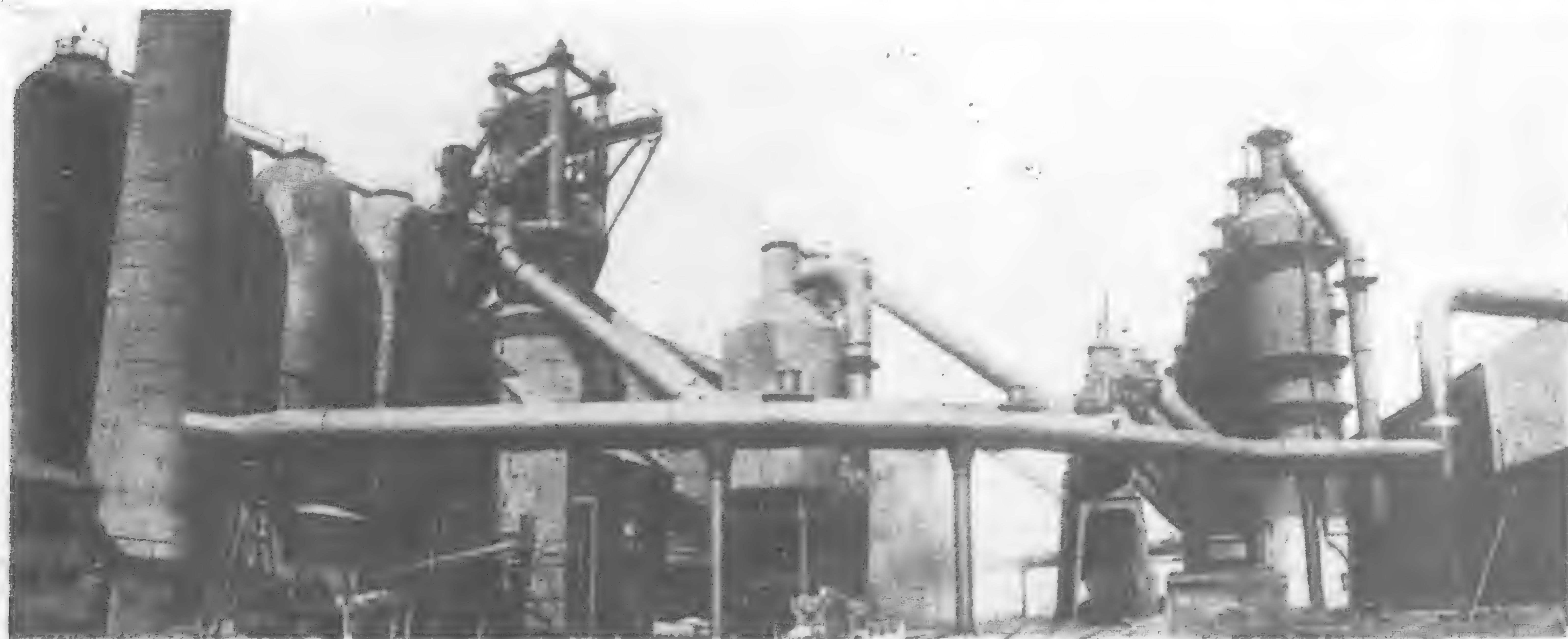
worse, and their architecture, except here and there in Kiev and Erivan, is abominable. That the Bolsheviks, however, are capable of erecting beautiful non-industrial edifices is proved by the delightful new clubhouse of the Putilov factory in Leningrad, the Moscow subway, the magnificent Rostov-on-Don theater, several recently completed sanatoriums on the Caucasian Riviera, a big block of houses in Kiev, and by some of the twelve new schools erected in Kiev in the last four months and a number of the 72 new schools put up in Moscow in the same short period. One is impressed in all cities by newly asphalted streets, by many new parks, squares and flower gardens, and by the tremendous quantity of trees which have been planted in the streets and in double lines, four lines in the case of the ninety-kilometer Dnieprepetrovsk-Zaporozhie highway, along arterial roads.

The most significant change in the cities is the greatly improved management of industrial units. I collected data in many places on the reduced cost of production. Smooth plant operation is now common whereas a year or two ago it was the exception. Chief Engineer Ter-Asaturov of Putilov's told me that their productivity per man had risen 25 per cent in the last year. The value of their output this year is 218,000,000 appreciated roubles as against 185,000,000 roubles in 1934, yet the number of workers dropped from 28,000 to 25,000. Director Tolmats of the Frazer Tool Cutting Machine in Moscow stated that the personnel was taking better care of machines and wasting fewer materials. Frazers and the Kharkov tractor plant, both of which I have often investigated, function better than ever, and the conveyor in the latter moves with perfect regularity. This was not the case last year.

Zaporozhie, the new factory town on the left bank of the Dnieper opposite the great dam, is beginning to work as a well co-ordinated whole and consuming a much larger percentage of the station's power. The station, moreover, has just commenced to send current to the Krivoi Rog iron mines 120 kilometers away.

In all these plants and at the tea factory outside Batum I saw complicated Soviet lathes which have replaced similar machines formerly imported. A large new shop at the Kharkov tractor plant will install only Soviet-made equipment. In the numerous hospitals and sanatoriums which I visited the X-ray apparatus and all other intricate medical appliances came from home factories. The U.S.S.R. formerly bought large gear cutters for special engines in Germany at 500 marks apiece. Some of them, I am told, were of inferior quality.

Frazer's is now satisfying all Soviet requirements in this field. A new plant in Batum is producing the machines needed for the



One of the U.S.S.R.'s new "Giants," the "Azovstal" Metallurgical Works in Marioupol. The Blast Furnace Department

score of tea factories under construction near that city. Kiev is building an immense factory to produce completely automatic lathes hitherto purchased abroad. The U.S.S.R. is not only making machines. On a considerable scale, it is making the machines which make machines.

Soviet industries are achieving valuable technological successes. The Stalingrad and Kharkov tractor plants, while continuing to work on the wheel tractor, are quickly re-equipping themselves for the manufacture of a stronger caterpillar tractor. Until recently Soviet factories borrowed and copied what Europe and America had evolved before them. Now they are forging ahead themselves. The shortage of labor is accelerating technological progress—which is as it should be. To every industrial director I interviewed I put the same question: "What is your most serious problem?" and the invariable reply was: "Labor scarcity." The Red Banner Textile Mill in Leningrad has a placard on its bulletin board which begs employees to invite their friends and relatives from the villages to come and take jobs at the plant. Putilov's needs two thousand more hands, skilled and unskilled, but cannot find them. All railway stations have too few porters. The building of a road leading out of Rostov had to stop on account of labor shortage. Every construction operation prominently displays a sign asking bricklayers, plasterers, carpenters, etc., etc., to apply. It is the same story throughout the entire country.

Under the pressure of this circumstance, two things are happening: the percentage of women in industry, even in metallurgical plants, is rising steadily, and processes are being mechanized which would otherwise continue to be done by hand. From being the most backward, the Donetz coal basin is to-day the most mechanized mining district in Europe with the exception of some small Belgian fields.

The oilfields of Baku were a bustling scene during my previous visits in 1924, 1927 and 1931. This time I saw very few people. Exploitation has been mechanized, and the only workers about are the drillers of new wells. Putilov's have introduced welding instead of riveting in the production of freight platforms and of turbines because it gives a 30 per cent economy of labor and because a good welder can be trained in two months and a riveter in only six. Putilov's has been holding conferences on the mechanization of lifting and on the installation of belts, cranes, etc. to eliminate "dirty work." Some directors are experiencing difficulties in keeping workers in their forging departments and blast furnaces. To cope with this situation working conditions will have to be improved.

Mechanization, which is a means of solving the difficulty of quantity by raising quality, has given a powerful impetus to technical studies. In many plants 60 per cent, occasionally as high as 80 per cent, of the workers take evening technical courses. Expert mechanics and engineers, too, attend perfection schools. Every factory has its inventors' club, its rationalization circles and its production conferences. The parks of culture and rest, and summer camps for "Pioneers," notably Artek in the Crimea, have fitted out excellent workshops where boys and some girls learn science and technique while playing with self-made toy aeroplanes, gliders, radios, telephones, telegraphs, cameras, motors, and pedal automobiles. Numerous factories possess expensively equipped preparatory technical schools for youths. The U.S.S.R. is breeding a race of technicians and mechanics.

Meanwhile, however, the scarcity of qualified workers and even of unskilled labor continues to perturb the authorities. I see no early solution of this problem, especially since fewer peasants are seeking work in the cities. The young generation in the agrarian collectives of course wants to get higher education and to partake of other amenities of urban life, yet, whereas private agriculture in the huge farming region of the Ukraine engaged only 44.5 per cent of the available labor supply in 1925-26, the collectives of the Ukraine now use 72 per cent, and this despite the introduction of 152,162 tractors, 11,332 combines and 24,706 motor lorries into those collectives in the last four years.

The collectives are intensifying and diversifying their work, and they need more hands. Indeed they need qualified hands, and the youth which goes to town to study therefore frequently returns to the country to operate machines. In Leningrad, furthermore, the Press reports that old, highly skilled mechanics are taking jobs in collectives because factory working conditions displease them. Village life is becoming more attractive, and since agrarian mechanization and the organization of village industries, which has already commenced, enable the mechanic to apply his special

knowledge on the farm, the competition between city and collective for the labor supply promises to grow fiercer.

This situation challenges the cities to offer more to their inhabitants. Economic compulsion thus supplements the Bolsheviks' will to raise the still low standard of living. All cities are overcrowded, and apartment accommodations are woefully inadequate. Additional houses are cancelled out by population growth. In Baku, for instance, floor space in dwellings was doubled between 1926 and 1935 (from 1,482,000 sq. meters to 3,000,000 sq. meters) but in the same period the population rose from 320,000 to 700,000. Moscow has a grandiose plan for its complete reconstruction. Other cities have adopted equally ambitious schemes. Their fulfilment, however, will require at least ten years. The Soviets have solved the food problem and except among a small handful of the declassed and disfranchized, as in Odessa, there is no privation. All prices are falling, and real wages rising. But prices, especially of bread, must come down much more. People everywhere are nicely dressed, and in Rostov, Kharkov, Moscow, Kiev, Nalchik, etc., the evening crowd of promenaders makes an excellent impression. Nevertheless, limited housing facilities will long depress the Soviet urban living level.

The peasant is not as tempted by the city as in former years, when the village was so bad that it offered no alternative. It would be difficult to exaggerate the metamorphosis which the Soviet village has undergone since collectivization began in 1929. The peasantry is talking and thinking in Bolshevik terms, and those persons whose wish was father to the notion that collectivization would organize the peasants for the first time in history and thereby enable them to present effective opposition to Bolshevism guessed wrong. The reverse is the case. Culture has entered the village, moreover. Numerous villages now have seven and even ten year schools where before the revolution they had none. Cinema films and theater performances are becoming customary. A village without a children's nursery is rare. More physicians and a large number of new, though primitive, hospitals serve rural areas. Expectant peasant mothers receive vacation with pay from the collective before and after childbirth. This blessing, formerly granted only in cities plus the assurance of prosperity, is raising the already high birth rate, and I really cannot understand why the Bolsheviks are worrying about undiscoverable small families.

The remarkable advance of agrarian technique reduces dependence on meteorological factors; mechanization grants manœuvring power to take advantage of favorable weather and to prevent crop destruction. Collectivization has made Russian farming a more exact science. Vernalization or the germination of seed before planting shortens the growing season. The spread of fallow ploughing conserves soil moisture and kills weeds. Combines reduce losses in harvesting. The ubiquitous agronomist is dictator on the Soviet countryside. This year's crop is excellent—in the Ukraine it is twice the 1934 yield—and wheat is already being shipped to England and other nations from Black Sea ports. In Czarist Russia, even intelligent people believed that every tenth year must bring a serious famine and every fifth year a crop failure. Events tended to confirm this belief. But that barbarous past is disappearing.

Nevertheless, the Russian village, whose content has been completely revolutionized, still wears the face of the ugly, unsanitary Czarist village of mud-walled, straw-thatched, floorless, uncomfortable huts. The collectivized village has only had time to change its basic economy. It is building piggeries, cow barns, stables, schools, warehouses, vegetable cellars, etc. With rare exceptions, it has not yet reached the stage of home construction. But in numerous villages brick kilns and tile factories are being erected, and one sees other preparations for large-scale building activity which should get under way within a year.

Agricultural productivity per hectare is increasing. I have a suspicion that the value of Soviet crops will this year exceed the cost of consumers' goods available for sale to the peasantry. This was the case in 1934 in the small Kabardinian-Balkarian territory, where I encountered peasants who had between 500 and 700 roubles in cash left over from last year's crop. They could not spend it because the commodities they wanted were unobtainable. This phenomenon will probably spread to much vaster sections of the Union. The trouble is that the threat of war and the necessity, for other reasons as well, of broadening the industrial base, has prevented the complete transfer of emphasis from heavy to light or consumers' industries, and the volume of goods, much greater

though it be than in 1933 and 1934, consequently still fails to meet requirements. Peasants are wearing city suits and shoes. Peasant girls wear high-heel slippers and fine dresses. Bicycles have invaded the farming regions. Some collectives buy automobiles. But they could buy much more. They tell one that they need metal beds, watches, urban furniture, musical instruments, better clothes, etc., etc. This demand will soon become a loud cry.

The Soviets have broken an ancient precedent and are importing consumers' goods from Japan with part of the money realized from the Chinese Eastern Railway sale. They have plenty of gold and an active foreign trade balance, and I understand that they propose to import in 1935 considerable quantities of wool, cotton, coffee, cocoa, and other articles of daily use. But this welcome procedure will not end the dearth of goods. That consummation must wait upon the completion, late in 1936 and in 1937, of hundreds of light industry factories provided for by the second Five Year Plan.

Such is the busy Soviet Continent. The whole country boils with activity. In the last six weeks I visited eleven important cities, several smaller ones like Nalchik, Dnepropetrovsk Yalta, etc., and many villages and resorts. I travelled by train, automobile, steamer, and aeroplane. I talked to hundreds of people in all walks of life and entered many homes, offices, and factories. On such a trip, in years gone by, one would encounter many enthusiastic citizens and some disgruntled citizens. Especially peasants would grumble. Peasants, and particularly peasant women, are not accustomed to conceal their political sentiments. But this time there were no complaints; there was no discontent. The village tax rate this year is low, and the collectives are gratified by Moscow's cancellation of a debt of 437,529,000 roubles representing credits advanced by the State in recent years to the collectivized peasantry. The efforts of the authorities on behalf of the nation and the results of those efforts are visible to the naked eye. They bring steady improvement in the life of every man, woman and child. The nations of the U.S.S.R. are full of loyalty, optimism, and unbounded confidence in a bright future. These feelings emanate not from verbal official promises but from uninterrupted achievements and from the promise of further progress inherent in those achievements. The Soviet Union is on the way to becoming Europe's greatest economic Power. The enemies of Bolshevism are guilty of a serious tactical blunder: they should not worry over Soviet shortcomings and mistakes whether alleged or real. They should consider its rising might. Foreign critics have made the mistake of underestimating the Bolsheviks.

* * *

Supplementing the foregoing of special interest with regard to the progress of heavy industry within the Soviet Union through the past four years is the summary of a report made by Serge Orjónikidze, People's Commissar of Heavy Industry presented before the delegates last year of the All Union Congress of the Soviets. This summary, published in the *British Russian Gazette and Trade Outlook*, is as follows:

Electrification of the U.S.S.R.

The rated capacity of our electric stations increased from 2,876,000 kw. at the end of 1930 to 6,212,000 kw. by January 1, 1935.

In 1930 the electric stations of the Union together produced 8,368,000,000 kw. of electric power, while in 1934 20.5 billion kws. were produced.

In 1930 we had 6,154 km. of electric power transmission lines and on January 1935 we had 12,207 km.

During the past four years the following heating and power stations have been built and started;—Kuznetsk Station—84,000 kw.; Berezniki—93,000 kw.; heating and power station at Yaroslavl Combinat—25,000 kw.; Krivoy Rog Station—25,000 kw.; Lipetsk Station—24,000 kw.; heating and power station of the Gorki Auto Plant (Nijni Novgorod)—24,000 kw.; the station of the Kharkov Tractor Plant—15,000 kw.; Lugansk Station—16,000 kw.; Uralmash Station 10,000 kw.; Grozny Station 25,000 kw.; heating stations of the Moscow Thermo-Technical Institute—36,000 kw.; Krasnozavodsk Station in Kharkov—25,000 kw.; Kazan Station—20,000 kw.

On January 1, 1931, we had 210,000 kw. of rated heating capacity, and in 1935 we have 870,000 kw.

We invested during these four years 2,655 million roubles in the building and extension of electric stations.

The total capacity of the new district and large factory stations built during these four years amounts to 1,682,000 kw. The capacity of the district and large factory stations which were extended during this period rose from 829,000 kw. to 1,959,000 kw.

Such are the results of the electrification of the Union. The electric stations fulfilled the 1934 plan with a surplus of 955 million kilowatt hours.

New Work Planned

The Commissariat of Heavy Industry will undertake further building of new district and factory electric stations with a capacity of 747,000 kw.

We must produce in 1937 38 billion kilowatt hours of electric energy.

This year 925 million roubles were invested in the construction of district electric stations.

The Coal Industry

In 1930 we mined 48,455 million tons of coal. In 1934 we produced 92 million tons.

The task of the coal districts of the Soviet Union is to provide 112.2 million tons of coal in 1935. At the end of the Second Five Year Plan, we must give 152.5 million tons of coal: this is no easy task but one capable of fulfilment.

Our technical equipment is splendid.

We are now carrying on experimental work for the underground gasification of coal. There are some signs that this work may be successful, but at present it is difficult to say to what extent.

We have built in Kemerovo a coal distillation plant which will produce 10,000 tons of liquid fuel.

The Oil Industry

The demand for kerosene, gasoline and oils is growing, and will continue to grow each year. In 1934 we produced 72,000 automobiles. The 1935 plan provides for 92,000 automobiles, but this is only a drop in the ocean.

We produced 93,000 tractors in 1934; in 1935 we must produce 98,000. On the fields of the collective and State farms 311,000 tractors are working. All these require enormous quantities of fuel. Can we satisfy these demands? According to the data of the Chief of Geological Survey Administration, Academician Gubkin, the total oil reserves in the Soviet Union at present are estimated at three billion tons, or 32 per cent of the entire world's resources, which places the U.S.S.R. first in the world in natural oil reserves (in 1934 our oil production was 25.6 million tons).

In Baku and its adjoining districts we have 1,325 million tons; in Embanef 639 million tons; in Ishimbayeva 60 million tons; in Maikop 81.8 million tons; in Grozny 138 million tons; in Central Asia 240 million tons. In addition there is much unexplored territory in our country: With our tremendous natural resources it is possible to produce as much oil as necessary for our country, including oil for export. The shortage of pipes and equipment of Soviet manufacture rendered it impossible to develop work on the scale which is necessary. We had therefore to import pipes and all equipment from abroad and to pay for them in gold. This situation however has been partially eliminated, or is being eliminated, and we have every hope of widely developing the oil industry with our own pipes and equipment.

During the past four years we invested 2.135 million roubles in the oil industry. In 1934, 25,600,000 tons of oil and gas were produced—135.9 per cent of the 1930 output.

The program for the production of oil and gas for 1935 is 30,300,000 tons. By the end of the Second Five Year Plan we must produce 46,800,000 tons of oil and gas annually. In 1935 we must sink 1,580,000 km. of wells and put into operation six refining and 14 cracking units and lay 1,060 km. of pipe lines.

Ferrous Metallurgy

Our most difficult and intricate task was to develop ferrous metallurgy. Without metal there could be no mention even of any kind of industrialization or reconstruction of the national economy. In pre-war days the metallurgical industry produced 4.2 million tons

of cast iron, 4.2 million tons of steel and 3.5 million tons of rolled steel. In 1930 we had five million tons of cast iron, 5,863,000 tons of steel, 4,813,000 tons of rolled steel and 224,000 tons of high grade rolled steel. But the country's demand was enormous. We were faced with the task of forcing the tempo of building new large metallurgical plants. We developed the construction of new plans and the reconstruction of old ones on a tremendous scale. We began to build the Kuznetsk Magnitorsk, Zaporozhstal, Azovstal, Tula, Lipetsk, Krivoy Rog and Tagil Plants and began to reconstruct the Dzerzhinski, Makeyevsk, Voroshilov, Krasny Odjher, Electrostal and Zlatoust Plants. We set about the building of pipe factories; the Pervo-Ural, Nikopolsk, Mariupolsk, Taganrog, Earl Liebknecht, Sinarsk, Lipetsk, Vyksunsk, Makeyevsk and others.

It is doubtful whether any other country at any time built so many metallurgical plants simultaneously.

In the course of four years 5,306 million roubles were invested in the ferrous metallurgy. During these four years we started 24 new blast furnaces, of which 13 have a capacity of from 800 to 1,000 cu.m. and six a capacity of more than a thousand cubic meters. We increased the aggregate capacity of our blast-furnaces from 27,000 cu.m. in 1930 to 49,000. This was an increase of 81 per cent. We started 80 new open-hearth ovens with a ground surface of 3,000 sq.m. thereby increasing the aggregate surface by 48 per cent. We started and restored 35 rolling mills, the blooming mills having capacity of 5,150,000 tons; the mills for preliminary operations 1,095,000 tons; the polishing mills 1,055,000 tons; this also includes five powerful blooming mills such as our country did not previously possess. Ten new pipe and tube mills were started with a capacity of 232,000 tons, whereas in 1930 the total production of iron tubes amounted to 264,000; 1,493 coke ovens were started with a capacity of 8.1 million tons of coke; in 1930 the total amount of coke consumed was six million tons.

The capacity of new lime quarries is 7.4 million tons; the actual extraction of limestone amounted in 1930 to 1,679,000 tons, reaching seven million in 1934. The capacity of the new dolomite quarries is 689,000 tons while in 1930 146,000 tons were extracted and in 1934 638,000 tons.

In the fire brick industry there was large scale construction of new plants, old plants were extended and quarries mechanized. The capacity of the fire brick industry rose from 1,227,000 tons in January 1, 1931 to 2,451,000 tons on January 1, 1935.

In 1930 all operations in the quarries, where fluxes and clay are extracted for firebricks, were carried out by hand; at the present time we have in these quarries 48 motor conveyors (in 1930 we had none), 48 excavators (in 1930 we had eight) and 80 locomotives of both wide and narrow gauge, as compared with 16 formerly.

In 1934 21.7 million tons of ore were extracted as against 10.6 million in 1930, which means that in four years the amount was more than doubled. Just as in the coal industry the victory in this branch of industry was the result of widespread mechanization of all operations. In Krivoy Rog we have 624 scraper winches in place of the 90 in 1930, and 33 electric engines; in 1930 we had none.

The ferrous metallurgical industry has 1,778 locomotives, 21,900 cars and 6,500 km. of railway tracks.

Dealing with cast iron, we held first place in Europe, our production being 10,440,000 tons. The growth for the year was 3,332,000 tons, a growth which has never been attained in the past by any country. This means 208 per cent of the 1930 production.

We produced 9,565,000 tons of steel, 163 per cent of the 1930 total. We produced 67,000 tons of ferrous alloys, as against 800 tons in 1930 and 287,000 tons of electro-steel as against 42,000 tons in 1930.

We produced 7,034,000 tons of rolled steel, 146 per cent of the 1930 output. Of this 1,249,000 tons were highgrade rolled steel against 242,000 tons in 1930, which is five times more than in 1930. The figure for iron tubes was 469,600 tons against 264,000 tons in 1930, which means a gain of 177.7 per cent. The production of railway rails was 786,000 tons as against 401,000 tons in 1930.

Comparing the amount of cast iron smelted here and in other countries, we had last year 10,440,000 tons; Germany had 8,720,000 tons, France 6,180,000 tons; England 6,000,000 tons, America 16.5 million tons, and Japan 2,300,000 tons.

Non-Ferrous Metallurgy

During the past four years we invested 2,160 million roubles in non-ferrous metallurgy. The output of non-ferrous metallurgy

increased in 1934 by 64 per cent as compared with 1930, but in spite of this, there is still a great shortage in non-ferrous metals. This branch of industry, with the exception of copper, was little developed formerly.

In 1930 only 4,400 tons of zinc were produced and there was no electrolytic zinc at all. In 1934 we produced 27,000 tons of zinc, including 5,425 tons of electrolytic zinc.

Of lead there were 11,000 tons in 1930 and 27,000 tons in 1934. We had no aluminium in 1930, 1931 or 1932. In 1934 we produced in our newly constructed Plants—the Volkhov and Dnieper Plants—14,400 tons. The program for 1935 is 25,000 tons. We must complete the Dnieper Aluminium Combinat which has a capacity of 45,000 tons. In 1935 we are assigning 32 million roubles to speed up the construction of the Ural Aluminium Combinat. An Aluminium Combinat will be constructed in Kandalaksha. Thus, by the end of the Second Five Year Plan we shall have 80,000 tons of aluminium, which will put us in first place in Europe and second place in the world.

We had no nickel, but in 1934 our Ural Plant produced the first 863 tons. Lately deposits of nickel ore have been discovered in Karelia and Aktyubinsk districts. Here too we have begun the construction of two large nickel plants.

In 1937 the output of zinc must amount to 90,000 tons and that of lead to 115,000 tons.

Last year we produced 53,600 tons of crude copper. The Plan for 1935 is 71,000 tons.

The gold industry is developing; last year it more than fulfilled its program.

Machine Building Industry

During the past four years Soviet machine building industry grew to enormous dimensions and now there is a very large number of plants equipped with splendid modern technique. During the past four years 7,580 million roubles were invested in the machine building industry, its capital increasing from 2,349 million roubles on January 1, 1931 to 6,169 million roubles on January 1, 1935, or 262 per cent of 1930.

During this period we have built such giants as the Stalingrad and Kharkov Tractor Plants, the Gorki Automobile Plant, the Moscow Automobile Plant, the Stalin Tractor Plant (in Chelyabinsk); these plants are giants in the full sense of the word. The automobile plants produced 4,000 trucks in 1930 and 55,366 trucks in 1934. In 1930 they made no passenger cars whilst in 1934 they produced 17,000. The number of tractors produced in 1930 was 12,731; in 1934 we produced 91,300 tractors including 10,573 caterpillar tractors. In 1930 we made no cultivator-tractors; in 1934 we turned out 2,680. The Urals Machine Building Plant, the Kramatorsk Plant, the Lugansk Locomotive Plant, the Kharkov Turbine Plant, first class airplane and motor plants, a ball bearing plant, tool and machine tool plants—all of these were built and completed during these years.

At the present time equipment and machinery for the needs of the Union are manufactured with but rare exceptions by our own plants. In 1930 we imported machinery to the value of 372 million roubles, in 1931 452 million roubles, and during the first eleven months of 1934 to the value of 48 million roubles only. At the same time the output of the Soviet machine building industry increased from 3.8 billion roubles to 9.8 billion roubles.

Heavy Industry must certainly fulfil the obligation in relation to transport. In 1935 it must give railway transport 80,000 cars and 1,485 locomotives, all the necessary equipment, spare parts and rails. To fulfil this huge program we have mobilized plants which formerly did not build cars.

Our machine tool plants must manufacture during the years 1935, 1936 and 1937, over 10,000 machine-tools for the automobile and aviation industries and a vast quantity of forge-press and other equipment not formerly produced by us.

The precision machinery and optical industries have also grown during these years. Their output increased from 72 million in 1930 to 212 million roubles in 1934.

The plan of production of machinery for 1935 has been fixed at 11,267 million roubles.

Building Materials and Building Industry

During the past four years we invested 1,323 million roubles in this industry, increasing its fixed capital from 441 million roubles in 1930 to 1,199 million roubles on January 1, 1935. The

production of building materials at present amounts to 136 per cent of 1930.

The Chemical Industry

Four years ago we had only one modern nitrogen fertilizer plant in Chernorechye, Gorki district. During these years we built and began to operate nitrogen fertilizer plants in Berezniki, Stalino-gorsk (Bobriki), and Gorlovka. We have built new sulphuric acid plants and increased their total capacity from 375,000 to 968,000 tons or 258 per cent of 1930.

We have started the great Yaroslavl Rubber Combinat, built and started three synthetic rubber plants which mastered production rather well in 1934. We produced 11,000 tons of synthetic rubber in 1934.

During these years we invested three billion roubles in the chemical industry. The value of the production machinery increased from 585 million roubles to 2.3 billion roubles, the gross output grew from 968 million roubles to 2,372 million roubles in 1934, or 245 per cent of 1930.

The production of rayon in 1930 amounted to only 600 tons, in 1934 to 5,430 tons. All this has been accomplished during the past four years.

The Tasks of 1935

In 1935 we must make a fresh leap forward; our task is to produce goods to the value of 23,568 million roubles—an advance of 19.6 per cent over 1934.

We have to produce 24.9 billion kw. hours of electric energy.

To mine 104.08 million tons of coal

To extract 30,330,000 tons of oil

To smelt 12.5 million tons of cast iron

To smelt 11.8 million tons of steel

To produce 8,650,000 tons of rolled steel

71,000 tons of copper

25,000 tons of aluminium

To manufacture 97,000 tractors with an aggregate h.p. including caterpillars, of the Chelyabinsk tractor plant with 15,000 h.p.

To manufacture 92,000 automobiles, 20,000 combines, 30,000 two-axle cars for railways, 1,485 locomotives, including 470 powerfull FD locomotives and to manufacture general consumers' goods to the value of 1.5 billion roubles.

In 1935 heavy industry should carry out building operations amounting to 7,634 million roubles, launching the following:—

6 Blast furnaces	7 Bimetal rolling mills
34 Open hearth ovens	9 Coke batteries
24 Electric ovens	10 Sintering conveyors
6 Ovens for ferrous alloys	6 Oil refining pipes
7 Rolling mills	14 Cracking installations
6 Tube rolling mills	41 Shafts

THE MANCHOUKUO STATE RAILWAYS

(Continued from page 490)

Medical Fees

The General Direction fixed the medical fees as shown in the following table:—

EXTRACT FROM THE MEDICAL FEE TABLE

Items	Description	(MY)
Consultation Certificate	Valid for 30 days	0.20 per one certificate
Medical Call	Doctor Midwife	1.00 or over per time 0.50 or over per time
Medicine	Internal use : ordinary External use : high value	0.15 or over per pre- scription 0.30 or over per pre- scription
Hospital Charge (Including medicine and meals)	Special Class 1st .. 2nd .. 3rd ..	5.00 per day 3.00 per day 1.50 per day 1.00 per day
Minor Surgical treatment		0.15 to 1.00
Injection		0.30 or over per injection
Electrical ray treatment		0.50 to 1.50
Dental Surgery	Ordinary treatment False teeth, etc.	1.00 to 20.00 per treat- ment 4.50 to 500.00 per set
X ray examination		1.50 per case

As other medical facilities, emergency medical boxes are provided on trains, at stations, roundhouses, schools, shipyards, motor bus offices, etc., for first aid treatments for passengers and employees, and to the general public in remote points where hospital facilities are not provided. Moreover, the railway sends out travelling medical corps from time to time to give consultation and treatment both to employees and local inhabitants.

Plague Prevention

The General Direction with the co-operation of Manchoukuo Government is giving its best effort in preventing the spreading of bubonic plague which occurs in few places. For this purpose Bubonic Plague Research Bureau was organized at Tungliao in

1934 which is now engaged in intensive research to stamp out this epidemic from Manchuria. The following figures show remarkable decrease as a result:—

Year	No. of cases
1933	1,146
1934	898
1935	394

Besides the above the following matters are also undertaken:—

- (1) Examination of the drinking water at all important places along the railways.
- (2) Treatment of trachoma among the railway employees.
- (3) Sanitary inspection of railway employees' quarters.
- (4) Distribution of preventive pills for typhoid fever and dysentery among the railway employees.
- (5) Holding hygiene exhibition and show moving pictures on hygiene at various places.
- (6) Particular attention is given to the production of "Kumiss," the fermented horse milk, at Fulaerhechi near Tsitsihar which is known to be an effective drink for the cure of tuberculosis.

French will Build Railway for China

Formal conclusion of an agreement between the Communications Ministry of the National Government and a French syndicate for joint construction of a railway between Chengtu and Chungking, Szechuen Province, has been announced by the official Central News Agency. The agreement was recently signed by representatives of the two parties.

Following the conclusion of the agreement, four Chinese and French officials flew to Chengtu. The party included Mr. Fontaine, representative of the French syndicate, Dr. Wei Wen-pin, assistant general manager of the China Development Finance Corporation, Mr. Liu Pu-cheng, director of the Bank of Communications, and Mr. Teng I-kuang, chief of the bureau of construction of the Chengtu-Chungking Railway.

Upon their arrival at Chengtu, they conferred with General Liu Hsiang, chairman of the Szechuen Provincial Government, and other high provincial officials, when a definite program for the railway construction is reported to have been worked out.

Actual construction of the line will start as soon as materials arrive from France.

The Practical Application of Town Planning in Ceylon

By O. WEERASINGHE, A.R.I.B.A., A.M.T.P.I., Engineering Association of Ceylon

A STUDY of the census returns of the principal towns of Ceylon during the last 50 years will reveal the fact that in most cases there has been a remarkable increase in urban population. During this period the population of Colombo has increased by over 170,000, and that of Kandy by 13,000. Considerable increases have also taken place in most of the important provincial towns. With increase in the population there has been a corresponding increase in the size of towns and in the density of building. Land values in the central areas of most towns have been forced up, with the result that intensive building has taken place without much regard to health and convenience. Likewise, open land around towns has been covered with buildings without any provision having been made for open spaces, new roads and other public needs. Having watched the values of land being forced up in this manner, the authorities have been obliged to come in at this stage and purchase at high prices such land as may have been left in order to satisfy, in an indifferent manner, important public needs. In this way huge sums of public money have been wasted.

It would be interesting to consider the saving that could have been made in Colombo, by the Municipality, if suburban development of the last 25 years was controlled according to a definite town plan and the land for public needs purchased before it acquired the present high values. To-day it should hardly be necessary to urge the desirability of a proper system of town planning in Ceylon. The advantage of land around a growing town being laid out on a plan, prepared with forethought and care, to provide for the needs of the growing community seems self evident.

The great drawback to any regular system of town planning in Ceylon has been the absence of adequate legislation for enforcing town planning schemes. Since the introduction of the Housing and Town Improvement Ordinance, however, considerable town planning powers have been vested with local authorities. For instance, Section 27 of the Ordinance gives power to local authorities to allocate special areas within their districts for residential, commercial and industrial purposes, and to make regulations with reference to buildings as may be necessary to preserve the amenity of such areas. But if we intend making our towns more healthy and less inconvenient for future generations to live in, and to save unnecessary expense on works of town improvement, we shall need to carry much further the good work begun by the Housing Ordinance.

We shall need powers to make the preparation of town planning schemes compulsory upon all local authorities whose districts are in the course of development, or likely to develop, or which contain ancient monuments and places of natural beauty.

We shall need powers to compulsorily purchase land for open spaces within and around growing towns, and to regulate the number of buildings to be built per acre of land, and to control their character and design. But, above all, we need to infuse the spirit of civic design in our towns. Hitherto both the public and the authorities have been concerned only with the sanitation and water supplies of towns. However important a good water supply and a proper drainage system might be for public health, there is need for beauty if urban life is to be complete.

The Civic Survey

The first essential need before town planning is possible is for local authorities to undertake careful surveys of the existing conditions in their districts. As a town planning scheme must both direct and limit the development of the area to which it applies, success can only be expected if it is based upon a thorough survey and understanding of existing conditions. The following are some of the more important considerations in a civic survey:—

1. Historical features :

- (a) Periods of growth.
- (b) Historical buildings.
- (c) Archaeology.

2. Natural Topography and Climate :

- (a) Contours, heights and rivers.
- (b) Surface and underground geology.
- (c) Rainfall.
- (d) Temperature.
- (e) Wind.

3. Agriculture and Vegetation :

- (a) Relation of agriculture and vegetation to geology.

4. Communication :

- (a) Roads.
- (b) Railways.
- (c) Canals.
- (d) Density of traffic on road.

5. Population :

- (a) Density of population in different areas.

6. Health :

- (a) Death rates and infantile mortality in different areas.
- (b) Diseases in different areas.
- (c) Relation to housing and population.
- (d) Movements of population.

7. Open Spaces :

- (a) Private open spaces.
- (b) Public open spaces.
- (c) Places of natural interest and beauty.

8. Natural Zoning :

- (a) Distribution of industries, businesses and residences.

9. Social Conditions :

- (a) Distribution of different nationalities.
- (b) Distribution of different religions.

10. Land Values.

It would be unnecessary, however, for towns to undertake comprehensive surveys of all the above items. Every town has its own problems and the survey should be confined to all those activities that have a bearing on such problems. For example, in Anuradhapura the main problem is that of preserving ancient sites from the encroachment of modern buildings and the survey should aim at carefully ascertaining the sites of ancient buildings, the tendency of modern development and the availability of sites for future development both within and outside the town, so that in making town planning proposals the areas containing ancient monuments could be reserved as antiquarian zones, and by making regulations with reference to new buildings it should be possible to preserve the amenity of these areas. At the same time provision could be made in those areas which are free of ancient structures for modern residential, commercial and industrial development.

To take another example : in Kandy the pressing problem is central congestion and overcrowding. The survey, therefore, should deal with the existing conditions of housing and traffic in the central area, the movements of the people, and the availability of land for building outside the city. The importance of such a survey cannot be underestimated in Kandy where the natural beauty of the surrounding district is being gradually destroyed by the erection of modern buildings on sites that are chosen indiscriminately by the builders, without regard to the harmony of the surroundings. There is no question of opposition to this modern growth, but whatever is added must be controlled stringently as to character and placing. A single bungalow roofed with pink artificial tiles or a glaring advertisement is able, at a stroke, to destroy the composed beauty of such a landscape as that around Kandy. A survey of the surrounding district, however, would enable the Municipality to ascertain areas outside the town in which modern development could be permitted without injuring the existing natural beauty.

Zoning

Once the civic survey has been made and carefully studied, town planning proposals can be outlined. In the first place every town should be zoned or divided into different areas for residential, commercial and industrial purposes. It is absolutely essential for the health and convenience of any community that there should be some distinct separation between the residential, commercial and industrial portions of any town. It may be said without exaggeration that most of the civic problems of to-day can be ascribed to the lack of systematic zoning of towns in Ceylon. Residential, commercial and industrial buildings have been allowed, and are still permitted in many towns to be erected without regard to the amenity of the locality. The main, and too often the only object of the local authority being the return that it would get in the form of rates and taxes from such buildings.

The spreading of both commercial and residential buildings along important roads (ribbon development) is another wasteful and ugly form of growth that is taking place outside most Ceylon towns owing to the lack of careful zoning. Take for instance the new Avisawella Road; a haphazard bungaloid growth is gradually spreading on both sides of the road. Strips of the countryside are being colonized without any rationale of social grouping, or economics of estate development, or æsthetics of rural design. Socially, there can be no focussing of civic life; economically, there is a future heritage of administrative expenses, the "ribbon development" being clearly the most extravagant type of lay-out to sewer, water, light and police; æsthetically, it inflicts the maximum damage to the country landscape—the same number of houses reasonably grouped could be made to drop into place almost unnoticed. Here is an opportunity for zoning. Controlled development could be made to take the place of haphazard growth. Definite areas round existing villages and towns along the road could be zoned for modern development, and outside them only a very loose-type of building, say one house in five acres, might be permitted. The result would be that instead of a continuous built-up street, there would be a number of well-developed villages and towns, separated by tracks of open country in which a few houses will be inconspicuously scattered.

An important consideration in making a zoning plan for any town is to make provision in each zone for future development based on a careful study of the present tendencies of growth. In Colombo, for example, a study of the present tendency of residential development will reveal the fact that it is spreading outward from the city. Improved and cheap means of transport, services of water and lighting, the relative cheapness of suburban land as compared with that in the city, all these, aid this process of decentralization. In making a zoning plan for greater Colombo, therefore, adequate provision should be made for this population in carefully selected areas outside the city. For instance, it might be possible to zone for the development of a number of "satellite towns" at suitable places around Colombo. Nugegoda, Ganguawila, Mirihana, Hendela and many other villages around Colombo offer good building sites, and with improved means of communication should form ideal "dormitory satellite" towns of Colombo.

Roads and Open Spaces

Having outlined the zoning proposals the next stage would be to lay down the proposed new street lines and open spaces. This is an opportunity for civic design. Instead of the monotonous parallel streets that are common in suburban areas of Ceylon towns, streets can be "designed" in varying patterns, following the contours of the land and taking account of existing natural features. This method has the advantage, not only of imparting interest and beauty to suburban development, but with skilful planning, will enable a considerable saving of streets, sewers, etc., while providing the same extent of street frontages.

The advantages of defining the widths and positions of future roads, road-widenings and open spaces in the undeveloped areas of towns are many. In the first place it would secure the local authority from the payment of compensation for buildings that would otherwise have been erected on the sites of these reservations. Secondly, it would enable the local authority to acquire these reservations at their present values before development takes place and enhances land values, and thirdly, it would encourage land owners to develop their property.

The present method of developing suburban land in Ceylon allows very little scope for civic design in the lay-out of streets and open spaces. As there is no regular town plan in any town showing the proposed development roads and open spaces, land owners are free to develop their property as they please, so long as they satisfy the authority as to the proper widths of access roads and open space about their buildings. This procedure has resulted in the wasteful development of roads, and the inadequate provision of open spaces (i.e., Wellawatte and Dehiwela) besides the monotony which is peculiar to "bye-law" planning. The reluctance on the part of local authorities to undertake comprehensive town planning schemes, especially in the lay-out of new roads and open spaces in undeveloped areas, is, I think, due primarily to their inability under the existing legislation to carry out such schemes with their limited finances, as it would be necessary for them to purchase the land reserved for such new roads and open spaces. On the other hand, if there was legislation to enable local authorities to recoup part of their expenses of acquiring these reservations in the form of a "betterment tax," levied on owners whose property would benefit by the making of these roads and the provision of public open spaces, the carrying out of town planning schemes would be financially more practical in Ceylon. But even without "Betterment" legislation it is possible for local authorities to undertake town improvement schemes as business propositions. For example, local authorities could acquire low-priced, undeveloped land on the outskirts of their towns and develop it by constructing streets, and providing open spaces and public services of lighting and drainage, and convenient access to the town center. Building blocks could then be sold at enhanced land values, which, in a carefully worked out scheme, should not only cover capital expenditure, but bring in considerable profits as well.

Preservation of Amenity

One of the main objects of town planning should be to preserve the existing amenities of towns. In Ceylon people are being lulled to sleep by the belief that the existing amenities of their towns will remain safe from modern development without their taking steps to protect them. If modern development is allowed to take its course, without being controlled, irreparable damage will be done to existing places of natural beauty and historic interest in Ceylon. With careful zoning, and by controlling the character and placing of new buildings (for which power is given under the Housing and Town Improvement Ordinance), it is possible to preserve the existing amenity of towns to some extent. In the absence of compulsory town planning legislation the protection of historical monuments and places of natural beauty in Ceylon should be the duty of the Central Government. Town planning schemes should be prepared by the Central Government for all localities containing historical monuments and places of natural beauty with the object of controlling modern development in these areas, and legislation should be framed to enable local authorities to enforce such schemes.

The architectural design of buildings in towns should be another important consideration in town planning. It must be admitted that in Ceylon very little consideration is given to the external appearances of buildings and their grouping and placing along streets in towns, with the result that towns are lacking in dignity and beauty. The authorities are only concerned with the basic requirements of light and ventilation as laid down in the Housing Ordinance beyond which they exercise no control. It might help considerably if prospective builders are advised by the authorities to consult qualified architects in the preparation of the plans and elevations of their buildings, or else given instructions in the preliminary stages of making the plans, on the type of elevation that would be desired, having regard to the amenity of the locality.

In the foregoing Paper I have only very briefly dealt with a few aspects of town planning that are possible of practical application in Ceylon. The proper planning of towns has been a long felt need in this country, but as yet there has been no attempt made to establish a regular system of town planning or to formulate a Town Planning Ordinance. The delay has been due, chiefly, to ignorance and to lack of official interest. But with a wider knowledge of the subject and its possibilities, and with official support, I am convinced that a beginning can be made, which will result not only in great saving of public money, but in making our towns more healthy and beautiful.

Telephonic Communications in China

By W. H. TAN, Secretary and Director, China Electric Company, Shanghai in "Electrical Communication"

DURING the past years, a serious effort has been made by those in authority in China for the establishment within the country of a good telephone communication system, both by the installation of new plant and by making improvements to the existing lines and equipment. This work has been carried out despite handicaps, including shortage of funds available for this type of work—it being considered more important to expend the money available on railroads and highways. Additional factors involved have been political disturbances, which in a number of cases have necessitated complete changes of plans; and the difficulties introduced by the existence in certain districts of bandits who have frequently completely removed the telephone wires. This latter difficulty is, however, not as serious as formerly, since the building of highways, in many cases, has provided the authorities with means for quickly reaching places where the presence of bandits is indicated. A country as vast as China is not easy to control, and it is only by close co-operation between the Ministry of Communications and the various operating Administrations that long distance telephony is becoming practicable.

Nearly every large city in China and also a great number of the smaller towns have telephone exchanges of one type or another, but facilities enabling subscribers in one town to talk to those in another have until recently been practically non-existent. Improvements and new projects recently undertaken have aimed at overcoming this deficiency.

There are approximately 164,000 telephone subscribers in the whole of China, of which approximately one-third are in the Shanghai area, which includes seven exchanges with over 52,000 subscribers in the system operated by the Shanghai Telephone Company, an associate company of the International Telephone and Telegraph Corporation. This company's system has been described.

The Greater Shanghai area contains ten automatic exchanges with approximately 52,000 lines of automatic equipment. Automatic exchanges have also been installed in the cities indicated in the accompanying table:

AUTOMATIC EQUIPMENT INSTALLED IN CHINA

	No. of Lines
Canton	10,000
Changshu	1,000
Foochow	1,500
Hangchow	3,000
Hankow	8,500
Nanking	6,000
Shanghai Area	52,000
Swatow	1,000
Tientsin	9,000
Tsingtao	4,000

Automatic equipment installed in China totals 96,000 lines—65 per cent Rotary and 35 per cent Step-by-Step.

It is interesting to note that Peiping, with 16,400 subscribers, is still operating on the common battery manual system. Tientsin, in addition to three automatic offices with 9,000 lines, has two common battery manual offices with 6,000 lines. Other common battery manual exchanges of any size are: Soochow (2,000 lines), Tsinan (3,000 lines), Amoy (2,200 lines), and Wusih (1,400 lines). Ningpo has 2,100 magneto lines. Doubtless, when more important projects are completed, these common battery manual exchanges will gradually be converted to automatic.

With the exception of a cable installed underground between Canton and Hongkong, all toll lines are carried overhead. In the past, iron wire was mostly used, but recently an endeavor has been made to substitute copper wire on routes which are important from a traffic point of view. For some years, a few toll circuits have existed between Shanghai and Nanking, but up to two or three years ago the chance of getting a good connection over these

circuits was very remote, chiefly on account of noise and poor transmission. However, about two years ago, a new pole route with copper wires was constructed following the new highway and this constituted a great improvement. Other long distance circuits which at present exist are those between Tientsin and Peiping, and Shanghai and Hangchow (Chekiang Province), as well as a comprehensive toll network in the latter Province. At present Hankow, with a population of approximately 1,500,000, is unable to communicate by telephone with any of the other larger cities in China.

In Canton, there is an exchange of the Rotary type having a capacity of 10,000 lines; and the cable between Canton and Hongkong provides efficient and stable toll circuits, but no means exist at present for communication between this system in the South and the cities in Central and Northern China. The Hongkong-Canton cable was manufactured and installed in 1931 by Standard Telephones and Cables, London.

It is apparent from the above that the present state of telephone communications in China is poor, but the work now being undertaken by the authorities is such that this situation will, within the course of the next year or so, be considerably changed. The Government has been able to make arrangements with the British Boxer Indemnity Fund for the supply of a considerable amount of up-to-date equipment for making improvements in its long distance telephone system. The money which has been obtained from this source has been devoted to the establishment of two main systems. The first, which was nearing completion while the present article was being written, comprises several high power, short wave radio equipments which will provide telephonic communications between Shanghai, Hankow, and Canton. The second comprises equipment and line plant which will provide a long distance communications system by wire between important points in a number of provinces.

The planning of this system was carried out by the Chinese Telephone Administration in co-operation with Standard Telephones and Cables, London, which is supplying the toll boards, repeater equipment, and the cables for river crossings. The lines themselves have been designed in accordance with the most modern practices so that, at a future date, additional circuits can be obtained by the installation of carrier telephone equipment. Where the route crosses the large rivers of China, cables of special design and suitable for carrier telephony operation have been installed. The repeater equipment, located at a number of points along the route, is of the latest design and manufacture, and is of the type described in an article entitled: "The New Standard Repeater Equipment,"* by J. S. Lyall. Facilities provided on the toll boards which are being installed, will enable the speedy establishment of connections in the most efficient manner. It is expected that communication over the new system will be established between Shanghai and Hankow before the end of the present year.

An interesting means of providing telephone communication is being adopted in South China in the district around Canton, where the country is so cut up by rivers and creeks that the erection of pole line routes would be a difficult proposition. The authorities have decided in this case to employ 7-10 meter ultra-short wave radio facilities whereby a number of towns, which thus far have been isolated telephonically, will be brought in contact with the Canton telephone system.

The Ministry of Communications, in planning its telephone communication system, has not overlooked connections to other countries and has already established, by means of short wave radio, a circuit between Shanghai and Japan. For the past year or more, it has been carrying on tests with both England and America and it will not be long before China will be connected by radio to the large international telephone networks of the world.

* "The New Standard Repeater Equipment," by J. S. Lyall, *Electrical Communication*, April, 1935.

Engineering Notes

COMMUNICATIONS

LONG DISTANCE TELEPHONE.—The Hsuancheng - Nanking - Shanghai long-distance telephone service connecting southern Anhwei and Kiangsu has been opened.

NEW HIGHWAY.—Sian-Chingtzukwan Highway, stretching from the Shensi capital to the Shensi-Honan border, was formally opened on June 6. The new road, which is 260 kilometers in length, was completed within twenty months and at a cost of \$1,700,000.

TOKYO-YOKOHAMA HIGHWAY.—Construction has started on the new Tokyo-Yokohama national highway and on the rebuilding of six other national highways. The expenditure on the Tokyo-Yokohama road will be Y.13,000,000 over a six-year period, with Y.2,000,000 to be spent in 1936. On roads in Yokohama and between the towns of Fujisawa and Chigasaki, Kanagawa Prefecture, and Chigasaki and Nino-miya-machi, a total of Y.2,100,000 will be spent.

USAMI TUNNEL.—Extreme temperatures, water and crumbling, shifting rock have been added to the engineering difficulties of digging the Usami tunnel in Japan, but hope for its completion has been revived, and final penetration is expected next March. The original schedule, calling for operation of trains between Ajiro and Ito in 1937, may be kept. Heat is produced when air strikes the freshly dug iron sulphide, putting the workmen in a temperature ranging from 86 to 98 deg. F. and averaging 95 degs. Soil producing such a high temperature is unequalled elsewhere. Cool air is forced into the tunnel, enabling the men to proceed. Between 800 and 4,000 lbs. of ice are used daily.

MODERN BRIDGE.—The Sunkiang authorities have begun dredging the canal as a gesture toward improving things. Also the high bridge over which one had to trudge wearily is being torn down and a more modern bridge built with less grade, making it possible for ricscha traffic to go over it.

ROAD BUILDING.—Work has started on a motor road from Lienyun to Hsukow, there connecting with the motor road to Hsinpa and Haichow. Completion of this road will do much to relieve the isolated position of Lienyun. Besides carrying out a large road scheme between Panpu (Kuanyunhsien) and Tunghsin, Yangchiachi and Hsiangshuikowtsih, the China International Famine Relief Commission is now constructing a canal and motor road between Panpu and Hsinpa. This will serve to connect two main highways. The canal-road project will open up a necessary waterway and serve a most effective reclamation purpose. In addition, there is a large amount of road building and road rehabilitation being done by regular Government agencies. One of these runs from Haichow to Shahe and thence to Kanyuhsien, and is a most important link. Another leads from Haichow to Sutsien by way of Shuyang.

SHIPPING

JAPAN'S SHIPBUILDING.—Japanese shipyards are now engaged in the construction of 118 ships of more than 1,000 tons, authoritative figures revealed. Six vessels, aggregating 16,000 tons, out of a total of 733,400 tons on the stocks, have been ordered from abroad. Freighters top the list, numbering 87, aggregating 507,000 tons. Other vessels include fifteen passenger boats, 82,000 tons; seven oil tankers 67,000 tons and three whaling depot ships, 62,000 tons.

KOGANE MARU.—The new de luxe O.S.K. Beppu liner *Kogane Maru*, which was constructed at the Mitsubishi Dockyard, sailed on her maiden trip recently from Kobe. The ship is 1,906 tons gross, measuring 80.20 meters in length and 12 meters in the beam. Equipped with Diesel engines, she has a maximum speed of 17.447 knots.

HULUTAO.—The Hsinking government has decided to make Hulutao an open port from February, next year. The port facilities having been greatly improved, steamers of the 2,000 ton class can be accommodated now, and the port has a great future as an outlet for the products of Jehol, Hsingan and Chinchow provinces. The harbor committee of the S.M.R. Company is now making plans further to improve the port on a five-year program. The work will be started next year.

AVIATION

NEW AIR LINE.—With a view to further developing air communication in Szechuen, plans are being made by the China National Aviation Corporation for the opening of an air line along the Yangtze River in that outlying province.

The projected route starts from Chungking to Chengtu by way of Luhsien, Shuchow and Chiating, important cities along the Yangtze River in Southern Szechuen.

The passenger and mail service on the new line is expected to be inaugurated as soon as branch offices of the corporation have been established at Chuchow and Chiating.

It is understood that the newly purchased D.C. No. 2 Douglas Plane, which arrived here from America recently, will be commissioned for service on the new line.

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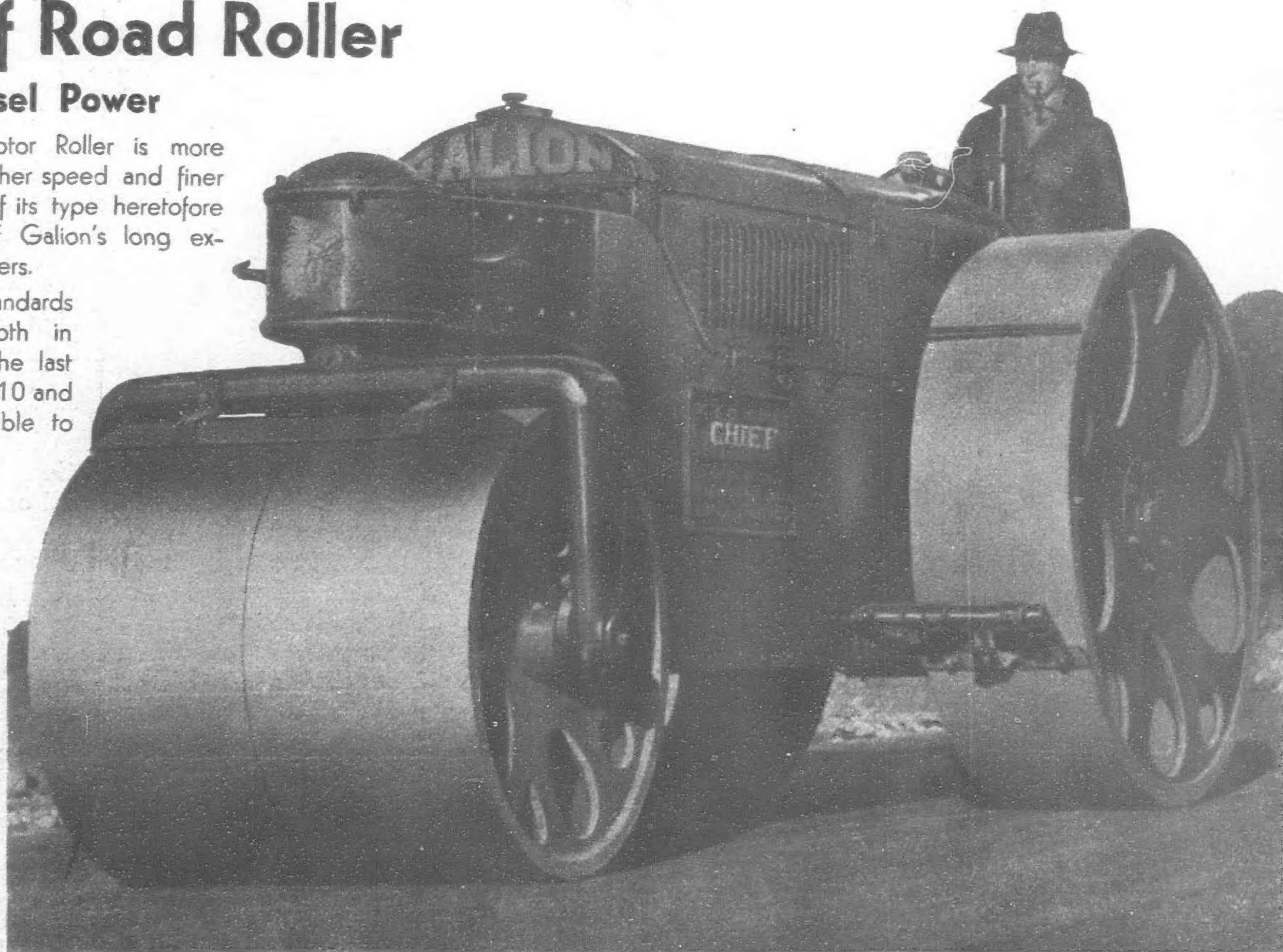
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